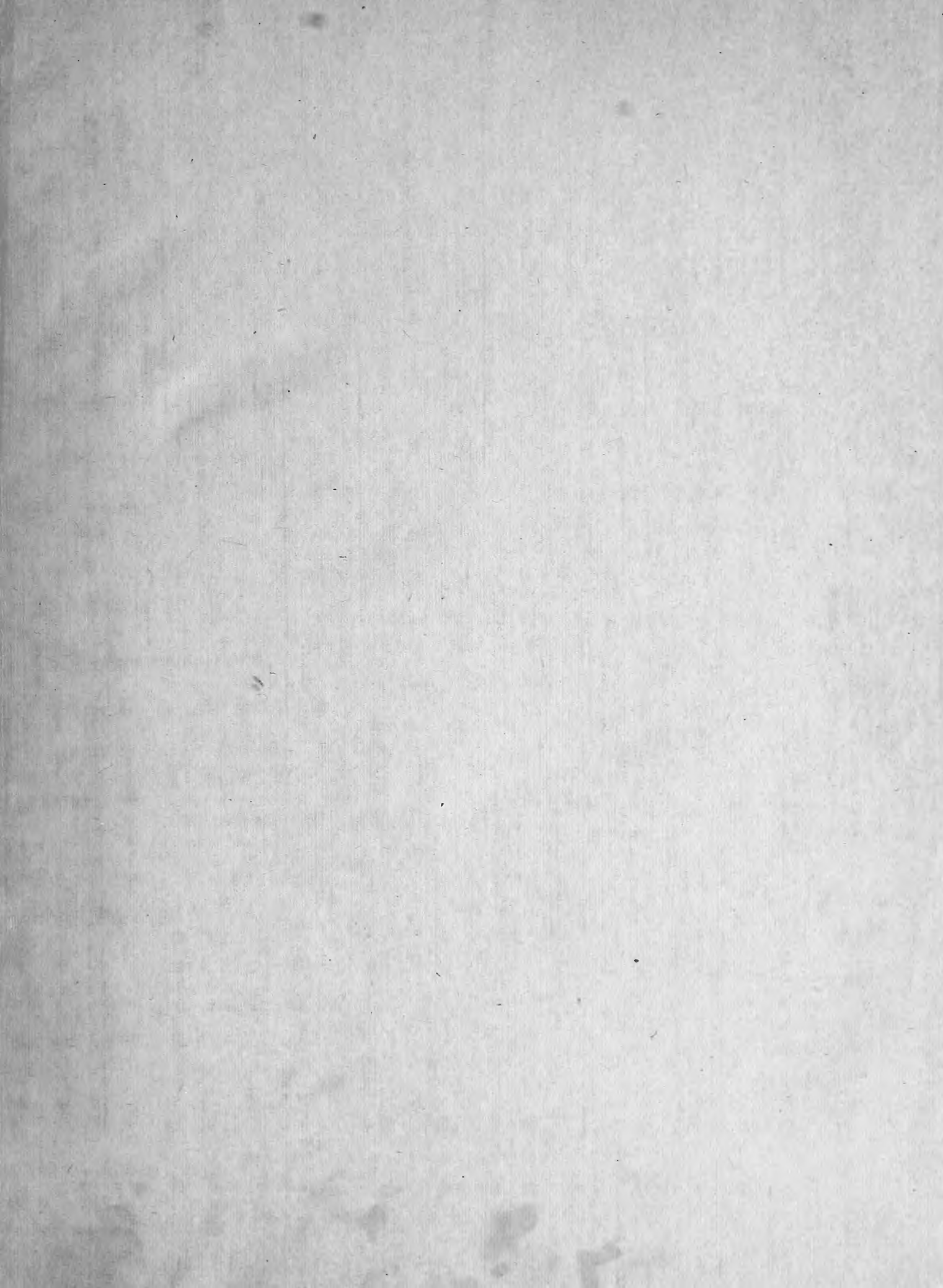


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AN

ILLUSTRATED CATALOGUE

OF

AMERICAN INSECT GALLS

BY

MILLETT TAYLOR THOMPSON, Ph.D.

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## PREFACE

MILLETT TAYLOR THOMPSON, Assistant Professor of Biology in the Collegiate Department of Clark University, was born at Providence, R. I., August 27, 1875, and died at Wesley Hospital, Chicago, Ill., August 7, 1907. He was graduated from Brown University with A. B. in 1898, was awarded A. M. in 1899 and Ph. D. in 1902. He was an instructor in that institution from 1898 to 1900 and spent nearly a year in research work at the American Museum of Natural History. He was elected Honorary Fellow in Biology at Clark University in 1902 and was immediately appointed Instructor in Biology in the Collegiate Department, being promoted to Assistant Professor in 1906. Dr. Thompson was elected to Sigma Xi in 1900 and to membership in the American Association for the Advancement of Science and the Boston Society of Natural History in 1902.

Dr. Thompson, during his connection with Clark University, mounted a beautiful set of Atlantic Coast Crustacea, restoring the colors by hand painting, and in collaboration with his friend, Dr. Harvey N. Davis, Brown, '01, made a large collection of New England Insecta known as the Thompson-Davis Entomological Collection and deposited with Clark University. Other lines of activity are indicated by the following list of published papers:<sup>1</sup>

The Breeding Habits of Animals at Woods Hole during the Month of September, 1898. *Science*, N. S., Vol. ix (1899), pp. 581-583.

A New Isopod Parasite on the Hermit Crab. *Contributions from the Biological Laboratory of the United States Fish Commission*, Washington, 1901, pp. 53-56, plates 9 and 10.

A Rare Thalassinid and Its Larva. *Proceedings of the Boston Society of Natural History*, Vol. 31 (1903), pp. 1-21, plates 1-3.

The Metamorphoses of the Hermit Crab. (Thesis for the Degree of Doctor of Philosophy at Brown University.) *Proceedings of the Boston Society of Natural History*, Vol. 31 (1903), pp. 147-209, plates 4-10.

Alimentary Canal of the Mosquito. *Proceedings of the Boston Society of Natural History*, Vol. 32 (1905), pp. 145-202, plates 12-17.

Immature Specimens of *Penella Filosa*. *Biological Bulletin*, Vol. viii (1905), pp. 296-307.

Three Galls Made by Cyclorrhaphous Flies. *Psyche*, Vol. 14 (1907), pp. 71-74, figures 1-3.

Dr. Thompson's largest work was a comprehensive study of the galls and gall makers of America. Unfortunately only a portion of this investigation was completed at the time of his death.

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<sup>1</sup>Most of this list is from Clark College Record, Vol. 2, No. 4, page 92, 1907.

The first part, a catalogue of the gall-making Cynipidæ, is published practically as he left it. The second part, a supplemental catalogue of gall-producing organisms, was assembled from the original notes by Dr. Thompson's father, the late S. Millett Thompson, who is also responsible for the selection and grouping of the illustrations on the plates. The work as planned by Dr. Thompson was to be a catalogue and handbook; that relating to the New England forms being based largely upon original studies. The editor has confined himself to the elimination of a few obvious errors and has endeavored to reproduce the work substantially as projected by its author. References to plates have been inserted throughout the text, descriptions of the plates written and the correct synonymy indicated wherever it seemed advisable or necessary. The original names used in the manuscript have been allowed to remain and where more recent terms are supplied or determinations made by the editor, such matter invariably appears in smaller (8 point) type. Dr. Thompson's collection of galls is deposited with Clark University.



# CATALOGUE OF GALL-MAKING CYNIPIDÆ OF NORTH AMERICA

## PART I. CLASSIFICATION BY GALLS

### GALLS ON OAKS (*Quercus*)

#### I. GALLS ON THE ROOTS:

- Belenocnema treatæ** Mayr. '81, p. 17, ♀, *Q. virens*, Fla.  
Polythalamous, clustered, fleshy.  
=**Dryorhizoxenos floridanus** Ash. '81, p. XXV-XXVI, ♂ ♀, *Q. virens*, Fla.  
**Callirhytis radialis** Bass. '89b, p. 237-238, ♀, *Q. alba*, Conn.  
Spring. Blister-like swellings of the bark.  
**Trigonaspis radialis** Ash. '97, p. 113-114, ♂ ♀, Utah.  
Rounded; fleshy, clustered.  
**Dryophanta radicola** Ash. '97, p. 116, ♀, scrub-oak, Mo.: Cook '04, *Q. alba*, Ind.  
May 21. Gall lost and not described.  
**Andricus apicalis** Ash. '97, p. 120, ♀, *Q. wisliceni*, Cal.  
Globular.  
**Callirhytis rhizoxenos** Ash. '97, p. 132, ♀, *Q. virens*, Ariz.  
June-July. Fleshy, polythalamous, irregular in shape.

#### II. GALLS OF THE BRANCHES AND TWIGS:

1. No visible gall or only slight swelling—  
**Andricus cryptus** Ash. '87b, p. 145, ♀, *Q. catesbaei*, Fla.  
May. Cells concealed under the bark.  
**Callirhytis ceropteroides** Bass. '00, p. 324, ♀, *Q. tinctoria*, Conn.  
Cells in old wood at base of new growth.  
**Neuroterus virgeus** Gill. '93, p. 166-167, ♀, Colo.  
May 8-13. Slight swelling.  
**Neuroterus catesbaei** Ash. '81, p. XV-XVI (*Cynips*), *Q. catesbaei*, ♂ ♀, Fla.  
April 28. Slight wavy swelling at base of new shoots.
2. The twig is dwarfed, but not specially modified—  
**Neuroterus distortus** Bass. '00, p. 336, ♂ ♀, *Q. bicolor*, Conn.  
Cells numerous, plate 1, 178.  
**Neuroterus tectus** Bass. '00, p. 331-332, ♂ ♀, *Q. prinoides*, Conn.  
May-June (see page 13). Slight basal swelling, or simple shortening due to larval cells.
3. The twig is dwarfed, distorted and forms a short ovoid mass—polythalamous—  
**Callirhytis (Cynips) scitula** Bass. '64, p. 683-684, ♂ ♀, *Q. tinctoria*, Conn.: Beach, *Q. rubra*, Iowa:  
Gill. '89, *Q. rubra*, Iowa, Mich.; *Q. tinctoria*, Mass.  
New growth in spring, plate 1, 192.

**Callirhytis tuberosa** Bass. '00, p. 311, ♂ ♀, *Q. ilicifolia* (?), Conn.; *Q. ilicifolia*, Mass.: Bass. '07, *Q. imbricaria*, Ohio.

Similar to last, but smaller.

4. The twig is swollen, dwarfed or distorted into a more or less club-shaped, polythalamous gall: a club-gall—

**Neuroterus batatus** Fitch 5 Rept., p. 810 (*Cynips*), ♀, *Q. alba*, N. Y., plate 1, 76: Bass. '64, p. 684, ♂ ♀, *Q. alba*, Conn.; = (?) *Cynips tuber*. Fitch, p. 806, ♀ (= *Ceroptres*); = O. S., p. 61 (see O. S. '65, p. 353–354): Beut. Cat. '04, *Q. alba* N. Y.: Bass. '77, *Q. bicolor*: Bass. '73, *Q. bicolor*; *Q. alba*, *Q. palustris*, Mass.

Old wood. May. Spring, June.

**Neuroterus consimilis** Bass. '00, p. 335, ♂ ♀, *Q. alba*, Conn.

Mid-summer. Like *tuber*.

**Andricus** (?) **floridanus** Ash. '87b, p. 137, ♂ ♀, *Q. parvifolia*, Fla.

Suggests brown fungus near ground.

**Neuroterus noxiosus** Bass. '81, p. 108–109 (*Cynips*), ♂ ♀, *Q. bicolor*, Conn.: Beut. Cat. *Q. bicolor*, N. Y.: Beut. '04, *Q. platanoides*, N. Y.: Gill. '89, *Q. bicolor*, Mich.: *Q. alba*, *Q. palustris*, Mass., R. I.

Old wood. Brood spring, plate 4, 118. Autumnal variety only; may not be at end of twig, but surround it (see p. 13).

\***Dryophanta longicornis** Bass. '00, p. 327, ♂ ♀, *Q. obtusiloba*, Conn.

Moderate enlargements. (May not be from the gall described.)

5. A swelling surrounding a twig, especially at the base of lateral shoots, often large, abrupt and woody: potato-galls—

(A) Not woody or but little wood-fibre surrounding the larval cells.

**Loxaulus mammula** Bass. '81, p. 76–78 (*Cynips*), ♂ ♀, *Q. alba*, Conn.

July. Cells under bark at base of twigs. *Q. alba*, Mass.

**Callirhytis ruginosus** Bass. '90, p. 76, ♀, *Q. virens* (?), N. Mex. (*suttonii*).

Surrounding substance hard knob, cellular, not woody.

**Callirhytis seminosus** Bass. '90, p. 76–77, ♀, *Q. castanea* (?), Ohio.

Cells very numerous.

(B) Woody fibre abundant.

**Callirhytis punctatus** Bass. '63, p. 323–324 (*Cynips*), ♀, *Q. rubra*, Conn.; = *Cynips q. podagræ*;

Walsh '64, p. 491–492, *Q. tinctoria*, Ill.: Gill. '89, *Q. rubra*, Mich.: Harvard Coll.,

Red and Black oaks, Mass., Conn., N. Y.; *Q. marylandica*, N. Y.: Beut. Cat. *Q.*

*nigra*, *Q. rubra*, *Q. coccinea*, *Q. ilicifolia*; Beut. '04, *Q. marylandica*, *Q. coccinea*, *Q.*

*rubra*, N. Y.; *Q. rubra*, *Q. nigra*, Mass.

April. Abrupt woody swelling, plate 1, 72.

\***Andricus batatoides** Ash. '81, p. X–XI (*Cynips*), ♀, *Q. virens*, Fla.; = O. S. '62, p. 259, D. C.

Abrupt swelling.

**Andricus coxii** Bass. '81, p. 112–113 (*Cynips*), ♀, *Quercus* sp., Ariz.; Bass. '00, p. 320, ♀.

Hard swelling.

**Compsodryoxenos maculipennis** Ash. '97, p. 129, ♀, *Q. virens*, Ariz.

May 9–19. Like *A. coxii*.

**Andricus frequens** Gill. '92, p. 247–248, ♀, *Q. undulata*, Col.

May 10. Dense, corky enlargements.

**Andricus medullæ** Ash. '85, p. VIII (*Cynips*), ♀, *Q. cinerea*, Fla.

Gradual enlargement of twig.

*Cynips chrysolepidicola* Ash. '97, p. 124, ♀, *Q. chrysolepis*, Cal.

Jan., Feb. Swelling surrounding twig. Like *medullæ*.

\**Neuroterus longipennis* Ash. '87b, p. 140, ♀, *Q. laurifolia*, Fla.

May. Oblong irregular swelling surrounding base of twig.

*Andricus wheeleri* Beut. '07, p. 464, pl. 37, fig. 7-9, ♀, ?, Ariz.

Resembles *medullæ*.

(C) Larval cells each surrounded by a tube of cellular tissue, differentiated from the general substance of the gall. These tubes may project from the surface in the matured gall.

(a) Tubes never project.

*Callirhytis suttonii* Bass. '81, p. 54-56 (*Cynips*), ♀, Cal.

The bark always covers the tubes.

(b) The tubes project like horns or spines.

*Callirhytis cornigera* O. S. '62, p. 251-253 (*Cynips*), *Q. palustris*, plate 1, 316, D. C.; O. S. '65, p. 358, ♀: Packard *Q. imbricaria*, Mo.; *Q. palustris*, N. J.: Bass. '64, *Q. ilicifolia*, Conn.: Beut. *Q. palustris*, *Q. ilicifolia*, *Q. nigra*, N. Y.: Gill. '89, *Q. rubra*, Mich.: O. S. '61, p. 53, Pin oak; *Q. nigra*, Mass.

Gall forms in May.

*Andricus clavigerus* Ash. '81, p. XXVI-XXVII (*Cynips*), ♀, *Q. laurifolia*, Fla.

May 3. Tubes secrete a honey-like liquid.

6. Polythalamous woody swelling at base of twig: excentric on twig—(grade to last group)—

*Callirhytis aquaticæ* Ash. '87b, p. 144, ♀, *Q. aquatica*, Fla.

Spring.

*Andricus davisii* Beut. '07, p. 463-464, pl. 37, fig. 1-6, ♂ ♀, *Q. nana*, N. J.

Summer, spring. Coalesce.

7. Pustular elevations of the bark, often enlarging the twig—

*Neuroterus rileyi* Bass. '81b, p. 149-150 (*Cynips*), ♀, *Q. castanea*, Conn. Late May. Riley '80, *Q. castanea*, Ohio: Cook '05, *Q. prinus*, Ind.: Packard *Q. castanea*, Ohio, Mo.; *Q. prinoides*, Mass.

Gall forms in May (confluent), plate 3, 173.

8. Monothalamous terminal enlargements or club-galls of twigs—

*Callirhytis clavula* O. S. '65, p. 351, proposed name for—: Bass. '64, p. 685-687, ♀, "*Cynips tuber*" Fitch, Conn.; = O. S. '61, p. 70-71, No. 25; = (?) O. S. *Cynips phellos*; O. S. '61, p. 70, ♀, *Q. phellos*, D. C., ♀. Late June; = (?) *Cynips arbos* Fitch, 5 Rept., p. 809-810, ♀ *Q. alba*, N. Y., = *Ceroptres*: Gill '89, *Q. alba*, Iowa, Mich.: Beut. Cat. '04, *Q. alba*, N. Y.: Cook '05, *Q. alba*, Ind.: Packard *Q. alba*, Pa., Mo.; *Q. alba*, Mass., R. I.

Terminal club, plate 3, 142.

*Andricus howertoni* Bass. '90, p. 82-83, ♀, N. Mex.

Terminal club.

*Callirhytis similis* Bass. '64, p. 685 (*Cynips*), ♂ ♀, *Q. ilicifolia*, Conn.: Harvard Coll., N. Y.:

Beut. Cat., *Q. nana*, *Q. ilicifolia*, N. J.; *Q. ilicifolia*, *Q. stellata*, Mass., R. I.

Terminal or not terminal, plate 3, 45.

## III. GALLS ATTACHED TO BRANCHES AND TWIGS:

1. Bullet-galls: *i. e.*, woody galls attached to the twigs, clustered or solitary—

## (A) Polythalamous.

*Andricus californicus* Bass. '81, p. 51-53 (*Cynips*), ♀, Cal. White-oak.

Cal., Oct. Subglobular, sessile.

*Andricus pomiformis* Bass. '81, p. 74-75 (*Cynips*), ♀, *Q. agrifolia*.

Cal., Mar. 1. Globular.

*Dryophanta pumiliventris* Bass. '90, p. 69-70, ♂. Ovoid, axillary.

\**Andricus maxwelli* Bass. '90, p. 83-84, ♂ ♀, Tex. Apr.

Locus uncertain; may belong in II, 6. Probably twig gall.

\**Andricus murtfeldtæ* Ash. '97, p. 117, ♀, Mo.?

Position on plant not stated. Irregular, pithy, spiny.

\**Andricus congregatus* Ash. '97, p. 120-121, ♀, *Q. chrysolepis* and *Q. agrifolia*.

Cal. Pedunculate on twigs, 2 x 4 cm.

*Andricus spongiola* Gill. '94, p. 235-236, ♀, *Q. garryana*, Wash.

Nov. Clustered, globular, brittle, 2-5 cm.

*Holcaspis truckeensis* Ash. '97, p. 127, ♀, *Q. chrysolepis* var. *vaccinifolia*, Cal. In slit on twig.

## (B) Small, monothalamous, galls without a distinct central larval cell.

## (a) Situated in fissures in the twigs.

*Andricus difficilis* Ash. '97, p. 143, ♀, *Q. cinerea*, Fla.

Aug., Sept. Rugose in belts, 1-10 in., globular, clustered.

*Andricus excavatus* Ash. '97, p. 121, ♀, *Q. rubra*, N. C., N. E.

Old wood. June 6. 5-6 mm. Fall to ground.

*Andricus imbricariae* Ash. '97, p. 122-123, ♀, *Q. ilicifolia*, *Q. imbricaria*, Mo.

Sept., Oct. Hard, clustered.

## (b) Not inserted in fissures of the twigs.

*Andricus gemmarius* Ash. '85, p. VIII-IX (*Cynips*), ♀, *Q. cinerea*, Fla.

Spring of year before. Feb., Mar. Oblong, seed-like, 1-10 in. long.

*Trisolenia saltatus* Ash. '87b, p. 142 (*Andricus*), ♀, *Q. coccinea*, Fla.

Mar. Late fall. Ovoid, axillary, ribbed, 5 mm. long.

*Cynips washingtonensis* Gill. '94, p. 235, ♀, *Q. garryana*, Wash.

Ovoid, monothalamous, on twigs; attached by point.

*Andricus indistinctus* Bass. '90, p. 81-82, ♀, *Q. alba*, Ohio.

Thin-walled bullet gall, round, 3-16 in.

## (C) Typical bullet galls of pithy or woody substance with a central cell in which the larva lives. This may be closely attached to the substance of the gall, or fill in a larger or smaller cavity within the gall.

## (a) Globular or sub-globular in shape.

*Holcaspis globulus* Fitch. 5. Rept., p. 810-811, fig. (*Callaspidia*), *Q. alba*, N. Y.: Bass. '63, p. 328, ♀, *Q. alba* and *Q. montana*, Conn.: O. S. '61, p. 67-69, *Q. obtusiloba*, *Q. alba*, *Q. prinus* (?): Gill '89, *Q. alba*, Oct., Mich.: Patton '92, *Q. pedunculata*, Conn.: Cook '05, p. 835, *Q. alba*, Ind.: Walsh '64, p. 639, *Q. alba*, *Q. macrocarpa*, *Q. montana*, Ill.: Beut. Cat., *Q. alba*, *Q. obtusiloba*, *Q. prinus*, N. Y.: Packard, p. 113, Mo.; *Q. alba*, *Q. stellata*, *Q. bicolor*, Mass., R. I.

Globular, smooth, axillary, plate 3, 7.



- Holcaspis omnivora** Ash. '85, p. VI-VII (*Cynips*), ♀, *Q. virens*, *Q. cinerea*, *Q. catesbæi*.  
Fla. Axillary, globular.
- Callirhytis agrifoliae** Bass. '81, p. 53-54 (*Cynips*), ♀, *Q. agrifolia*, Cal.  
Dec. 3-4 in., globular.
- Andricus pacificus** Ash. '97, p. 118, ♀, *Q. chrysolepis*, Cal.  
6-16 mm., pithy, globular.
- Andricus cinerosus** Bass. '81, p. 110-111 (*Cynips*), ♀, Tex.  
3-4 in., globular.
- \***Amphibolips fuliginosa** Ash. '85, p. VII, VIII (*Cynips*), ♀, *Q. laurifolia*, Fla.  
3-4 in.; brown, corky. May be a leaf-gall.
- Holcaspis fasciata** Bass. '00, p. 328-329, ♀, *Q. ilicifolia*, Conn.; *Q. ilicifolia*, Mass., *Q. ilicifolia*  
and *Q. rubra*, R. I.  
Bark broken at base of gall (filbert shape), plate 1, 145.
- Holcaspis rugosa** Bass. '81, p. 100-101 (*Cynips*), ♀, *Q. ilicifolia*, Conn., late fall: Gill. '89, *Q. prinus*, Mich.: Ash. '87, *Q. prinus* and *Q. bicolor*, Fla.: *Q. ilicifolia*, Mass.  
Gall forms Aug. ♀ Oct. Rugose, sessile, plate 1, 279.  
*H. globulus* Fitch.
- Holcaspis colorado** Gill. '93, p. 210, ♀, Colo. Rugose.
- Holcaspis rubens** Gill. '93, p. 29-30, ♀, Colo., Oct. 20.  
10-14 mm. May be rugose.
- Holcaspis corallinus** Bass. '90, p. 66, ♀, Cal.  
3-4 in., globular with horn-like processes.
- Holcaspis persimilis** Ash. '97, p. 126-127, ♀, *Q. nigra*, Nov. 10.  
7 mm., rugose. *Holcaspis* type.
- Holcaspis succinipes** Ash. '81, p. XI-XII (*Cynips*), ♀, *Q. virens*, Fla.  
1-10 in., clustered, globular; not axillary.
- Andricus wisliceni** Ash. '97, p. 119, ♀, *Q. wisliceni*, Cal.  
Oct. 3-4 mm., globular.
- \***Andricus chrysolepidis** Ash. '97, p. 119-120, ♀, *Q. chrysolepis*, Cal.  
Jan. 5-8 mm., ovate. Gall confused with *Compsodryoxenus brunneus*.
- \*(?)**Cynips mellaria** Riley Amer. Ent. 3, p. 298, *Q. undulata*, Colo.  
Secretes honey, crimson. Pea-shaped.  
*Holcaspis perniciosa* Bass.
- (b) Form more ovoid, with a point at apex.
- Holcaspis duricoria** Bass. '90, p. 64-65, ♀, *Q. bicolor*, Conn., Oct.-Nov.; = (?)*Cynips q. mamma*  
Walsh '69, p. 102, ♀, *Q. macrocarpa*, Ill.: Gill. '89, *Q. bicolor*, *Q. macrocarpa*, Mich.,  
Oct.: Beut. Cat., *Q. bicolor*, N. Y.: Beut. '04, *Q. platanoides*, N. Y.: Harvard Coll.,  
*Q. prinus*, Ohio, Conn., D. C.; *Q. coccinea*, *Q. palustris*, Mass., *Q. sp.*, R. I.  
Shape of hazel-nut, not axillary, plate 1, 59.  
*H. mamma* Walsh.
- Holcaspis perniciosa** Bass. '90, p. 68, ♀, Utah, 5-8 mm., ovoid.
- Holcaspis sileri** Bass. '90, p. 67-68, ♀, Utah. Pointed, ovate, sessile.
- Holcaspis canescens** Bass. '90, p. 66-67, ♀, Cal. Small *duricoria*.
- \***Andricus perplexus** Ash. '97, p. 122, ♀, Mo., Nov. 1. Globular, pointed, 5 mm., large cell.
- (c) Form more or less conical.
- Andricus coniferus** Ash. '81, p. XXVII-XXVIII (*Cynips*), ♀, *Q. phellos*, *Q. laurifolia*.  
Fla. Solitary, axillary, sessile, low-conical.
- Callirhytis crassicornis** Ash. '97, p. 130-131, ♀: Like *coniferus*, but imbedded in twig, triangular
- Andricus ventricosa** Bass. '64, p. 681 (*Cynips*), ♀, *Q. ilicifolia*, Conn. Spring. *Q. alba*, R. I.;  
*Q. tinctoria* and *Q. niger*, Mass.  
Gall appears late May. Not axillary, conical, sessile, plate 1, 129.

*Holcaspis bassetti* Gill, '89, p. 215-217, fig. 2, p. 221, ♀, *Q. bicolor*, Mich.

Oct. Not axillary, clustered, attenuated cone, plate 1, 214.

(d) Not globular or conical.

*Holcaspis monticola* Gill, '93, p. 30-31, ♀, Scrub oak, Colo.

Nov. Cylindric, truncate, 1-4 in. Bark broken at base.

\**Compsodryoxenus brunneus* Ash. '97, p. 129, ♀, Cal.

Elongate, oval, 5-8 mm. Gall confused with that of *Andricus chrysolepidis*.

*Holcaspis douglasii* Ash. '97, p. 127, ♀, *Q. douglasii*, Cal. Dec. Squash-shaped.

(D) Woody, with a central kernel, having the outer substance of the gall chambered, clustered.

*Andricus formosus* Bass. '64, p. 679-680 (*Cynips*), ♀, *Q. rubra*, Conn.

Old wood. Spring. Ovate, 40-50 clustered, plate 2, 332.

*Andricus capsualus* Ash. '85, p. IX (*Cynips*), ♀, *Q. catesbaei* and *Q. cinerea*.

Fla. Appears Apr. Spring of next year. Ovate, 15-20 clustered, fleshy on twig.

2. Galls with the structure of typical bullet-galls, but clustered in compact and characteristic masses about the supporting twig—

*Holcaspis ficigera* Ash. '85, p. VI-VII (*Cynips*), ♀, *Q. virens*, Fla.; = O. S. '62, p. 258, *Q. virens*, Fla.; = Ash. '81, p. XIV, "*Cynips q. ficus* (?)." Pruinose, compact, fig-like cluster.

*Holcaspis ficula* Bass. '81, p. 75-76 (*Cynips*), ♀, *Q. macrocarpa*, Ga.: Ash. '97, Par. Hymenopt., p. 189, Fla.

Not hard-clustered in a mass like a cedar-cone.

*Holcaspis spongiosa* Karsch.

*Loxaulus spicata* Bass. '00, p. 329, ♀, *Q. virens*, Ariz.

The mass looks like a red-colored ear of corn.

*Cynips strobilana* O. S. '62, p. 254, *Q. bicolor*, Pa., Md.; O. S. '65, p. 350, ♀: Bass. '64, p. 690-691 (*Cynips*), ♀: Beut. '04, *Q. palustris*; Cat., *Q. bicolor* N. Y.: Gill. '89, *Q. macrocarpa*, *Q. bicolor*, Mich.: Harvard Coll., *Q. bicolor*, Mass.: Packard, *Q. bicolor*, Mo.

Wedge-shaped cells in cluster.

*Andricus coronus* Beut. '07, p. 464-465, pl. 37, fig. 10, ♀, *Q. palustris*, N. Y.; *Q. aquatica*, Ga. Summer. Spring.

Ovoid, fluted, monothalamous, clustered.

3. Galls in compact cluster around twig, but bladder like and not woody as in last group.

*Xanthoteras forticornis* Walsh '64, p. 489-491 (*Cynips*), ♀, *Q. alba*, Ill.; = *Cynips ficus* Fitch, 5 Rept., p. 812-813, ♀ (*Ceroptres*), *Q. alba*, N. Y.; = O. S. '61, p. 69-70, *Q. alba*, D. C.: Bass. '63, Conn.: Beut. Cat. and '04, *Q. alba*, N. Y.: Ash. '87, *Chalcididae*, Toronto, Can.: Cook '05, *Q. alba*, Ind.: Walsh '68, *Q. alba*, Mo.: Beach '95, Iowa: Packard, Mass., Va., N. H.: Gill. '89, Mich.; *Q. alba*, Mass., R. I.

Gall appears in July. Old wood, plate 1, 122.

*Biorhiza*.

4. Galls on twigs consisting of fibrous material which conceals one or many cells in which the larvæ live—

(A) Cell large, solitary or clustered.

*Andricus dasydactyli* Ash. '97, p. 117-118, ♀, *Q. chrysolepis*, Cal.

Jan., Feb. Cells 2 cm. long; long wool fibres.

(B) Cells small, numerous, massed in a cluster beneath the fibres.

**Callirhytis operator** O. S. '62, p. 256-258 (*Cynips*), ♂ ♀, *Q. nigra*, D. C.: Bass. '00, p. 315, Conn., Bass. '73; *Q. ilicifolia*, Conn.: O. S. '65, *Q. ilicifolia*, *Q. palustris*, Conn.: Riley '73, p. 519, Black oak; *Q. ilicifolia*, Mass., R. I.: Walsh '64, p. 639; *Q. nigra*, *Q. palustris*, *Q. ilicifolia*, Ill.

Gall appears in mid-May. Flies in June, plate 2, 169.

**Callirhytis seminator** Harr. '41, p. 399 (*Cynips*), fly, *Q. alba*, Mass.: O. S. '61, p. 69, ♂ ♀, *Q. alba* D. C.: Walsh '64, *Q. alba*, Ill.: Ash. '87, *Q. prinus*, *Q. bicolor*, Fla., ♂ ♀, June, July: Beut. '04, *Q. alba*, N. Y.: Fitch 5 Rept., *Q. alba*, N. Y. Fly in July: Gill. '89, *Q. alba*, Mich. Fly in July: Cook '05, *Q. alba*, Ind.: Packard, *Q. alba*, Va. Fly June 13; *Q. alba*, Mass., R. I.

Gall appears early June, plate 2, 8. Flies the last of June.

#### IV. GALL CONSISTING OF ONE OR MORE LARVAL CELLS OR CAPSULES IN A LEAF-BUD:

##### 1. Hard cell or cells surrounded by a number of modified leaves—

(A) Cell surrounded by a few thread-like bodies.

**Dryophanta pallipes** Bass. '00, p. 327, ♂ ♀, *Q. alba*, Conn., spring.

(B) Cell surrounded by a rosette of linear leaves.

(?) **Cynips frondosa** Bass. '64, p. 688-689, *Q. prinoides*, Conn.; Harvard Coll., Md.: Ash. '96, p. 186 Mo.; *Q. prinoides*, Mass. Forms summer, emerges late May.

Leaves quite long, not always linear, plate 3, 165.

**Andricus foliatus** Ash. '81, p. XII-XIII (*Cynips*), ♀, *Q. virens*, Fla.

Leaves short, linear.

**Andricus stropus** Ash. '87b, p. 136, ♀, *Q. obtusiloba*, Fla.

Mar. Leaves linear.

(C) Several cells surrounded by a rosette of linear leaves.

**Andricus topiarius** Ash. '87b, p. 136, ♀, *Q. obtusiloba*, Fla.

Mar. 3-5 cells.

\*(?) **Cynips frondosa** Walsh '69, p. 72-73, Burr-oak, Ill.; White oak, Miss., plate 3, 165.

##### 2. Hard cell in the bud. No circle of modified leaves—

**Dryophanta gemula** Bass. '81, p. 104-105 (*Cynips*), ♂ ♀, *Q. prinoides*, Conn., May; Mass. Late May.

**Andricus calycicola** Ash. '87, p. 141, ♀?, *Q. laurifolia*, Fla.

Falls to ground in winter. Feb. May be in acorn-cup also.

##### 3. Soft capsule in bud, no modified leaves—

**Neuroterus vesiculus** Bass. '81, p. 97 (*Cynips*), ♂ ♀, *Q. alba*, Conn. Gill. '89, *Q. bicolor*, *Q. macrocarpa*, Mich. Early May. Mass., May.

Visible capsule, plate 2, 160.

**Dryophanta vesiculoides** Ash. '97, p. 114, ♂ ♀, *Q. obtusiloba*, Mo., May 10. Visible capsule.

**Neuroterus affinis** Bass. '81, p. 103-104 (*Cynips*), ♂ ♀, *Q. prinoides*, Conn. Visible capsule.

*N. vesiculus* Bass.

**Andricus cinnamomeus** Ash. '87b, p. 137, ♀, *Q. parvifolia*, Fla. Apr.

Single cell within bud (cone).

**Andricus cellularius** Gill '92, p. 247, ♀, *Q. undulata*, Colo. Late May. Cell within bud.

4. Capsules in bud, blasting it completely or so only a few deformed and imperfect leaves issue. —

**Dryophanta clarkei** Bass. '90, p. 69, ♂ ♀, *Q. alba*, Mass. Early spring.  
Capsules fill the bud.

**Neuroterus congregatus** Gill. '93, p. 166, ♂, Col. May 17.  
Bud becomes a mass of pubescent capsules.

**Neuroterus minutus** Bass. '81, p. 96–97 (*Cynips*), ♂ ♀, *Q. alba*, Conn.  
Leaves aborted, galls irregular, clustered in bud (polythalamous, 2–6 mm.)

**Neuroterus vernus** Gill. '90, p. 22–23, ♀, *Q. macrocarpa*, Iowa. (1) May, (2) June.  
Minute oval galls amid aborted leaves as with *N. minuta*.

V. GALLS OF THE LEAVES: (In some of the larger oak-apples the originating leaf is wholly aborted and the gall issues directly from the twig or bud.) It is not possible to assign these naturally to their groups in all cases.

1. Galls on the petiole of the leaf—

**Cynips sulcatus** Ash. '97, p. 123, ♀, *Q. virens*, Ariz. Mar., Apr. Rounded, size of pea.  
*Callirhytis*.

**Dryophanta carolina** Ash. '87b, p. 145, ♀, *Q. alba*, N. C. Feb. Small, hard; highly attached.

**Holcaspis arizonica** Cockerell '02, p. 183, ♀, *Q. arizonica*. Apr. 19.  
Globular, polythalamous, base of petiole.

**Neuroterus minutus** Bass.

**Neuroterus vernus** Gill.

2. Gall a swelling of the mid-vein, or sometimes of the petiole—

(A) Swellings abrupt.

**Andricus petiolicola** Bass. '63, p. 324–325 (*Cynips*), ♂ ♀, *Q. alba*, *Q. montana*, *Q. prinoides*, Conn.; = O. S. '61, p. 66–67, No. 18, *Q. prinus* (see O. S. '65, p. 351): Beut. '04, *Q. alba*, *Q. prinus*, *Q. platanoides*, *Q. minor*, N. Y.: Cat. *Q. alba*, *Q. prinus*, *Q. bicolor*, *Q. obtusiloba*, N. Y.: Cook '05, p. 830, *Q. alba*, *Q. prinus*, *Q. bicolor*, *Q. obtusiloba*, Ind.: Beach '95, Iowa: Gill. '89, *Q. alba*, *Q. macrocarpa*, *Q. bicolor*, Iowa, Mich. Fly July 5: Walsh '64, p. 487, *Q. discolor*, *Q. prinus*, Ill. June, July.

Harvard Coll. *Q. alba*, *Q. prinus*, *Q. tinctoria*, Mass.

**Andricus cicatriculus** Bass. '81, pp. 101; Bass. '90, p. 80, ♂ ♀, *Q. alba*, Conn.  
*Q. alba*, *Q. prinus*, *Q. prinoides*, R. I., Mass. Fly late June, plate 3, 171.

**Callirhytis parvifoliæ** Ash. '87b, p. 138, ♀, *Q. parvifolia*, Fla.

Polythalamous, indented above and rounded below lamina.

**Callirhytis reticulata** Bass. '90, p. 74–75, ♀, *Q. virens* (?), N. Mex. Much like *cicatricula*.

**Andricus morrisoni** Ash. '97, p. 116–117, ♂ ♀, Ariz., June 23.

Above and below lamina at base of blade, fleshy, polythalamous.

**Andricus quinqueseptum** Ash. '85b, p. 299–300, ♂, *Q. obtusiloba*, Fla. July.

Base of blade, monothalamous, conical above, rounded below; partitioned.

(B) Less abrupt and localized enlargements of mid-vein (or more rarely of lateral veins and petiole).

**Callirhytis tumifica** O. S. '65, p. 356–357 (*Cynips*), ♂ ♀, *Q. tinctoria*, *Q. rubra*, N. Y.: Cook '05, *Q. alba*, *Q. tinctoria*, Ind.; *Q. rubra*, Mass.

Swollen mid-vein, plate 1, 47.

**Callirhytis nigræ** O. S. '61, p. 66 (*Cynips*), ♂ ♀, *Q. nigra* and *Q. rubra*, D. C. Late June. Swelling along mid-vein.



**Andricus piger** Bass. '81, p. 105-106 (*Cynips*), ♀, *Q. tinctoria*, Conn. Autumn. Beut. '04, *Q. velutina*, N. Y.; *Q. rubra*, Mass.

Fly late Sept. Swelling on mid-vein, plate 2, 213.

**Callirhytis cellæ** Ash. '87b, p. 141-142, ♀, *Q. laurifolia*, Fla. Slight swelling.

**Neuroterus politus** Bass. '90, p. 89, ♂, *Q. undulata* (?), Utah. Swelling on mid-vein.  
*N. quercicola* D. T.

**Neuroterus flavipes** Gill. '90, p. 21-22, ♂ ♀, *Q. macrocarpa*, Iowa, July 6.

Hard swelling of mid-vein or lateral vein. 3-4 x 1-4 in.

**Neuroterus gillettei** Bass. '00, p. 334, ♂ ♀, *Q. obtusiloba*, Conn. Pustular swelling.

\***Neuroterus tectus** Bass. '00, p. 331. Cell in mid-vein, distorting leaf.

(C) The whole leaf (?) is swollen to a fleshy, elongated gall.

**Neuroterus noxiosus** Bass. '81, p. 108-109 (*Cynips*), ♂ ♀, *Q. bicolor*, Conn.

Spring, June (see page 6 for autumnal gall), plate 4, 118.

### 3. Galls involving or attached to the lamina of the leaf—

(A) Small blister-like or pustular swellings of the leaf-blade.

**Neuroterus howertoni** Bass. '90, p. 90, ♀, N. Mex. Blotches, walls thin.

**Neuroterus perminimus** Bass. '00, p. 332, ♂ ♀, *Q. alba*, Ohio. June, July. Minute blister.  
*N. nigrum* Gill.

**Neuroterus nigrum** Gill. '89, p. 218-219, 221, fig. 5, ♀, *Q. alba*, *Q. macrocarpa*, Mich., Iowa. Mid-May. *Q. alba*, Mass. Mid-May.

Over winters, plate 4, 141.

(B) Blister above lamina, woolly gall beneath.

**Neuroterus floccosus** Bass. '81, p. 111-112 (*Cynips*), ♀, *Q. bicolor*, Conn.

Over winters. Spring, Mass., plate 2, 103.

(C) Rounded galls with several cells imbedded in the lamina of the leaf.

**Callirhytis futilis** O. S. '61, p. 63-64 (*Cynips*), ♂, *Q. alba*, D. C., spring. Early July, Beut. Cat. '04, *Q. alba*, N. Y., fly, July: Bass. '63, Conn.; Bass. '89, *Q. alba*, Conn.: Gill. '89, *Q. alba*, Mich.; *Q. alba*, *Q. stellata*, Mass.

2-3 cells, plate 5, 49.

**Callirhytis papillatus** O. S. '61, p. 64-65 (*Cynips*), ♂, *Q. prinus*, D. C. Late June. Beut. Cat., *Q. prinus*, N. Y., fly in June: Cook '05, p. 827, Ind.; *Q. coccinea*, Mass.

2-3 cells, plate 4, 57.

**Callirhytis modesta** O. S. '61, p. 65-66 (*Cynips*), ♀, *Q. rubra*, D. C. Late June.

(D) Galls making a sort of thickened and elevated area in the lamina.

(a) The platform is formed of crowded, monothalamous galls.

**Dryophanta papula** Bass. '81, p. 107-108 (*Cynips*), ♀, *Q. rubra*, Conn., *Q. tinctoria*, Mass.: Gill. '89, *Q. coccinea*, *Q. rubra*, Mich. Fly, July 12.

Conical, confluent, plate 4, 270.

(b) The platform is made by a single polythalamous gall.

**Neuroterus favosus** Bass. '90, p. 87-88, ♂ ♀, *Q. tinctoria*, Ohio; *Q. palustris*, *Q. rubra*, Mass.

Irregular, pustular, elevated area, plate 3, 66.

*Neuroterus irregularis* O. S. '61, p. 65 (*Cynips*), ♂ (?), *Q. obtusiloba*, D. C. Appears in spring. Late May.

Succulent, elevated area, plate 3, 172.

*Dolichostrophus majalis* Bass. '64, p. 682-683 (*Cynips*), ♂ ♀, *Q. alba*, Conn. June. Ash. '87, *Q. prinus*, *Q. bicolor*, Fla. Like last.

*Neuroterus fragilis* Bass. '00, p. 335, ♂ ♀, *Q. virens* (?) Cal. Like *majalis* but smaller.

(E) Gall spherical, hemispherical or conical, usually succulent, and consisting of a wall that encloses a chamber in which the larval cell lies free; some of these galls are loosely attached to the leaf, but more often they are imbedded in the blade.

(a) Gall globular.

*Callirhytis palustris* O. S. '61, p. 62-63 (*Cynips*), ♂ ♀, *Q. palustris*, D. C., spring. Late May. O. S. '62, *Q. falcata*, *Q. coccinea*, *Q. tinctoria*; O. S. '65, *Q. tinctoria*, *Q. falcata*, *Q. coccinea*, *Q. imbricaria*, *Q. ilicifolia*; O. S. '70, p. 54, 56, N. Y. Late May: Walsh '64, *Q. tinctoria*, *Q. imbricaria*, Ill.: Beut. Cat. '04, *Q. palustris*, N. Y. Fly in May: Cook '05, *Q. palustris*, Ind. Fly, May: Bass. '63, p. 329, *Q. ilicifolia*, Conn.: Provancher Canada (F. Can. vol. 2, p. 163.)

*Q. rubra*, *Q. ilicifolia*, R. I., Mass. Mid-May. Fly early June. Succulent, globular.

The generic position is uncertain: O. S. '61, p. 62, called it *Cynips* (*Trigonaspis*?): Mayr '81, placed it in *Callirhytis* "doubtfully": Ash. '85, *Callirhytis*: Ash. '87, Cresson '87, *Dryophanta*. The presence of scutellar pits instead of a furrow and the simple (?) claws are *Callirhytis*; the smooth thorax, long radial area and shape of the abdomen favor *Dryophanta*. (*Dryophanta* according to Bassett.)

*Dryophanta*.

= (?) *Cynips notha* O. S. '70, p. 55-56, ♂ ♀, *Q. palustris*, D. C.

Late May (oval kernel).

*Dryophanta aquaticæ* Ash. '81, p. XVI-XVII (*Cynips*), ♂ ♀, *Q. aquatica*, Fla.

March. 3-10 in., globular.

*Dryophanta laurifoliæ* Ash. '81, p. XVII-XVIII (*Spathogaster*), ♂ ♀, *Q. laurifolia*, Fla., March. Globular.

*Dryophanta quercifoliæ* Ash. '85b, p. 299 (*Andricus*), ♂, *Q. catesbaei*, Fla.

May. Similar to *D. aquaticæ*, but smaller.

*Callirhytis pusulatoides* Bass. '90, p. 74, ♀, *Q. coccinea*, Conn.

On leaf margin.

*Dryophanta liberæcellulæ* Gill. '90, p. 24-25, fig. 1, ♂ ♀, *Q. rubra*, Iowa; *Q. coccinea*, Mich.

Late May. Does not pierce lamina. 6 mm.

*Dryophanta confusa* Ash. '81, p. XVIII (*Cynips*), ♀, *Q. laurifolia*, Fla.

Late April. Globular, small beneath leaf-blade.

(b) Hemispherical or conical, attached beneath leaf.

*Dryophanta cinereæ* Ash. '87, p. 144, ♀, *Q. cinerea*, Fla.

May. Conical (turret).

*Callirhytis saccularius* Bass. '90, p. 76, ♂, *Q. coccinea*, Conn.

Thin wall; conical, plate 2, 212.

*Xystoteras volutellæ* Ash. '97c, p. 260-261, ♀, *Q. macrocarpa*, Kan.

Jan. Conical; kernel loosely attached; 2 x 3 mm.

(F) Succulent, solid, spherical galls, usually firmly attached to the leaf-blade.

*Amphibolips nubilipennis* Harr. '41, p. 398-399 (*Cynips*), ♀, Mass.: Walsh '64, p. 485, ♂ ♀, *Q. rubra*, Ill.: Fitch 5 Rept., N. Y. (*Callaspidia*): Gill. '89, *Q. rubra*, Mich. Fly,

June 25:

Size of grape.

**Amphibolips sculpta** Bass. '63, p. 324 (*Cynips*), ♂ ♀, *Q. rubra*, Conn. Early July. Walsh '64, Red oak: Gill. '89, *Q. rubra*, *Q. coccinea*, Iowa, Mich. Fly, late June: Cook '05, p. 825, *Q. rubra* Ind.: Beach '95, Iowa:

*Q. rubra*, Mass. Fly, late June. Gall forms early June. Large size, plate 4, 188.

*A. nubilipennis*.

**Phylloteras rubinus** Gill. '89, p. 215, 221 (*Biorhiza*), ♀, *Q. alba*, Mich.

Fall. 2-3 mm. in diameter.

**Amphibolips racemaria** Ash. '81, p. XXVI (*Cynips*), ♀, *Q. laurifolia*, Fla.

Forms April, May. Mid-May.

(G) Small, solid, fleshy galls loosely attached to the leaf.

**Andricus rugosus** Ash. '81, p. XVIII-XIX (*Cynips*), ♂ ♀, *Q. laurifolia*. Fla. Late April.

Hemispherical, hard, fibrous.

**Sphæroteras mellea** Ash. '87, p. 138 (*Biorhiza*), ♀, *Q. parvifolia*, Fla.

Feb. Fleshy, often clustered.

*Biorhiza*.

**Acraspis compressum** Gill. '91, p. 197-198, ♀, *Q. rubra*, Iowa.

On ground over winters. 2-3 mm. White, wax-like in texture, plate 4, 78.

*Philonix*.

(H) Moderate-sized, hard galls, loosely attached to vein below leaf and with a faceted or spiny surface.

(a) Surface faceted.

**Acraspis pezomachoides** O. S. '62, p. 250 (*Cynips*), ♀, *Q. alba*, Md.; = (?) *Cynips q. pisum* Fitch 5 Rept., p. 818-819, *Q. alba*; O. S. '61, p. 53, D. C.; O. S. '65, *pisum*; = ♀ *pezomachoides*: Beut. Cat., *Q. alba*, N. Y.: Cook '05, *Q. alba*, Ind.: Harvard Coll., Mass.: Packard, p. 113, *Q. alba*, Mo.

*Q. alba*, *Q. bicolor*, Mass. Fly late Sept. Gall forms June, plate 3, 33.

*Philonix*.

**Acraspis macrocarpæ** Bass. '90, p. 84-85, ♀, N. Y., Mich., Ohio, Iowa. Autumn. Gill. '89, p. 221, *Q. macrocarpa*, Mich. ♀ Oct.: Beach, Iowa: Gill. '93, *Q. macrocarpa*, Iowa.

*Philonix*.

**Acraspis undulata** Gill. '93, p. 28-29, ♀, *Q. undulata*, Colo. Fly like *macrocarpæ*.

*Philonix macrocarpæ*.

**Biorhiza hirta** Bass. '64, p. 687-688 (*Cynips*) ♀, *Q. montana*, Conn.; = O. S. '62, p. 254, *Q. prinoides*, Md. (see O. S. '65, p. 378): Beut. Cat., *Q. monticola* N. Y. Like *C. pisum*.

*Philonix*.

(b) Facets of the surface pointed or spine-tipped.

**Acraspis echini** Ash. '87, p. 140, ♀, *Q. bicolor*, Fla. Nov. Spine-tipped.

*Philonix*.

(?) **Cynips prinoides** Beut. Cat., p. 257-258, pl. XI, fig. 6, ♀, *Q. prinoides*, N. J. Aug.-Sept. Single cell, facets pointed.

*Philonix*.

(c) Spines of the facets long.

**Acraspis erinacei** Walsh '64, p. 483-484 (*Cynips*), *Q. alba*, Ill.: Gill. '89, p. 186, *Q. alba*, Mich. Fly in Nov.; Gill. '96, p. 94, Iowa, N. Y.: Beut. Cat. '04, *Q. alba*, N. Y.: Cook '05, *Q. rubra*, Ind.: O. S. '73, Colo.

The fly has apparently never been described. It was assigned to this genus by Mayr '81, p. 30. (Ash. '87, p. 140, calls it "*Acraspis erinacei*.")

*Philonix*.

(d) Spines long, hair-like.

*Acraspis villosus* Gill. '89, p. 218, 221, fig., ♀, *Q. macrocarpa*, Mich. Late Oct. Beach '95, Iowa.  
On mid-vein.

*Philonix*.

(I) Solid galls attached to leaf with a central harder kernel or larval cell. These approach the oak-apple galls in structure.

*Acraspis lanæglobuli* Ash. '87, p. 139, ♀, *Q. bicolor*, Fla.

*Philonix*.

*Acraspis gillettei* Bass. '00, p. 323-324, ♀, *Q. alba*, Conn.

*Philonix niger* Gill.

*Andricus virens* Ash. '81, p. IX-X (*Cynips*), ♀, *Q. virens*, Fla.; = O. S. '61, p. 57-58, No. 2.  
Feb. Substance of gall pithy.

\**Acraspis niger* Gill. '90, p. 23-24, ♀, *Q. alba*, Mich., Iowa.  
Sept., Oct. Almost a fibrous oak-apple.

*Philonix*.

(J) Oak-apple galls: *i. e.* galls with a central hard kernel or larval cell, a firm (often hard) rind and a spongy or fibrous intervening substance.

(a) Intervening substance is spongy.

1. Size large. (The leaf is usually aborted and the gall appears to be attached directly to the twig.)—

*Amphibolips confluentus* Harr. '41, p. 397-398 (*Cynips*), fly, Red-oaks. Spring. Oct., ♀, *Q. rubra*, D. C. June. = *C. q. aciculata* O. S. '61, p. 56-57, ♀, *Q. rubra*, Ill. Oct. (O. S. '65, p. 354, all fuse); = *C. q. coccinea*, O. S. '62, p. 243-244, ♀, *Q. coccinea* D. C., June 25; = *C. q. spongifica*, O. S. '62, p. 244-245, ♂ ♀, *Q. tinctoria*, D. C., June 15.: Walsh '64 and '69, *Q. tinctoria*, *Q. rubra*, Ill. (1) June, (2) Sept.: Cook '05, p. 822, *Q. rubra*, *Q. tinctoria*, *Q. coccinea*, *Q. nigra*, Ind.: Bass. '63, *Q. tinctoria*, Conn.: Beut. Cat., *Q. rubra*, *Q. tinctoria*, *Q. coccinea*, *Q. nigra*, N. Y. (1) June, (2) Oct. or spring: Provancher, Red oak, Canada: Harvard Coll., *Q. tinctoria*, Mass.: Gill. '89, *Q. coccinea*, *Q. rubra*, Iowa, Mich. *Q. palustris*, *Q. rubra*, *Q. coccinea*, R. I., Mass., plate 2, 68.

*Amphibolips palmeri* Bass. '90, p. 86-87, ♀, Mex.

2 3-4 in. diam., globular.

*Amphibolips acuminata* Ash. '97, p. 126, ♀, *Q. nigra*, D. C., Md.

June 24. 2 x 1 in., spongy.

*Amphibolips longicornis* Bass. '00, p. 321-322 (O. S. '61, p. 69) ♂, Tex.

Ovoid.

*Amphibolips caroliniensis* Bass. '90, p. 85-86, ♀, *Q. obtusiloba* (?), N. C.

Globular, wrinkled.

2. Size small.

*Dryophanta rydbergiana* Cockerell '03, p. 217, ♀, *Q. rydbergiana*, N. Mex. On leaf, 6 mm.  
Spherical.

*Amphibolips spinosa* Ash. '87, p. 141, ♀, *Q. laurifolia*, Fla.

Jan. Globular, prickly.



(b) The substance lying between the rind and kernel is fibrous and often very scanty.

1. Size large; kernel central; leaf usually aborted.

**Amphibolips inanis**, O. S. '61, p. 58 (*Cynips*), *Q. rubra*, D. C.; O. S. '62, p. 242-245 (*Cynips*), ♀, *Q. coccinea*, or *Q. rubra* (?) D. C., June 20; = *Callaspidia confluenta* Fitch 5 Rept., p. 817, Red oak, N. Y.: Walsh '64 and '69, *Q. rubra*, ♂ ♀, ('69): Bass. '63, *Q. tinctoria* (?), Conn.: Beut. Cat. and '04, *Q. coccinea*, *Q. rubra*, N. Y., N. J.: Gill. '89, *Q. rubra*, Mich. June 20, ♀: Beach '95, Iowa: Cook '05, *Q. coccinea*, *Q. rubra*, Ind.: Harvard Coll., *Q. rubra*, N. H.

*Q. rubra*, *Q. coccinea*, *Q. alba*, *Q. palustris*, Mass., R. I. Fly, June 21, plate 3, 10.

**Callirhytis vaccinifoliae** Ash. '97, p. 130, ♀, *Q. vaccinifolia*, Cal.

Oct., Dec. 1-2-1 in. Globular, thin-shelled.

**Holcaspis centricola** O. S. '61, p. 58-59 (*Cynips*), ♀, *Q. obtusiloba*, D. C. Autumn. Cook '05, *Q. obtusiloba*, Ind. (Leaf not aborted O. S. '62, p. 247). 3-4 in. on leaf.

**Amphibolips ilicifoliae** Bass. '64, p. 681-682 (*Cynips*) ♂ ♀, *Q. ilicifolia*, Conn.: Harvard Coll., *Q. pumila*, Conn.: Beut. Cat. *Q. ilicifolia*, N. Y., N. J.: Beut. '04, p. 11; *Q. nana*, N. Y. *Q. ilicifolia*, Mass., R. I. May or June, gall. July, fly. Leaf aborted; ovoid, plate 4, 126.

**Amphibolips cinerea** Ash. '81, p. XIX-XX (*Cynips*), ♀, *Q. cinerea*, Fla.

Leaf absent; globular. 1 1-4-1 1-2 in. (On twig.)

**Amphibolips citriformis** Ash. '81, p. XXVIII (*Cynips*), ♀, *Q. phellos*, Fla.

Early May. Leaf absent; ovoid. 1 in. long.

**Amphibolips melanocera** Ash. '85b, p. 299, ♀, *Q. aquatica*, Fla.

June. Ovoid, leaf absent.

2. Size small; leaf aborted.

**Amphibolips tinctoriae** Ash. '97, p. 125, ♀, *Q. tinctoria*, Oct. Compressed, ovate, 2 x 1 cm.

**Amphibolips cookii** Gill. '89, p. 220, 221, fig. 6, ♀, *Q. rubra*, Mich.

Ovoid; on buds. Flies, Sept.

**Andricus femoratus** Ash. '87, p. 141, ♀, *Q. tinctoria*, Fla. Cook '05, p. 832, *Q. rubra*, Ind.

3-10 in.; globular. No leaf.

3. Galls small; leaf present and gall usually on under side; solitary—

**Holcaspis maculipennis** Gill. '94, p. 236-237, ♀, *Q. wrightii*, N. Mex.

1 1-2 cm. on leaf.

**Holcaspis brevipennata** Gill. '93, p. 31, ♀, *Q. undulata*, Cal.

1-1 1-2 cm. below leaf.

**Dryophanta bella** Bass. '81, p. 93-95 (*Cynips*), ♀, Ariz.

3-4 in. below leaf.

**Dryophanta emoryi** Ash. '97, p. 115, ♀, *Q. emoryi*, N. Mex.

Dec. 2-3 mm. on leaf. Few filaments.

**Andricus singularis** Bass. '63, p. 326-327 (*Cynips*), ♂ ♀, *Q. rubra*, Conn. July 10. Beut. '04,

Cat. *Q. rubra*, N. Y.: O. S. '65, D. C.: Gill. '89, *Q. rubra*, Mich. Flies June.

*Q. coccinea*, *Q. rubra*, Mass. Flies June 23. Tends to pierce lamina of leaf, plate 4, 71.

**Andricus osten-sackenii** Bass. '63, p. 327-328 (*Cynips*), ♂ ♀, *Q. ilicifolia* and *Q. coccinea*, Conn.:

O. S. '61, p. 56: Ash. '96, p. 186 Mo.:

Mass. Fly early July. Tends to pierce lamina of leaf, plate 2, 182.

(K) Galls small; leaf present and galls tend to cluster.

## (a) Cell central in gall.

**Dryophanta polita** Bass. '81, p. 99-100 (*Cynips*), ♀, *Q. obtusiloba*, Pa., N. J., Md. Spring. Beut. Cat. *Q. obtusiloba* N. J.; '04 *Q. minor* N. Y.

Very globular.

**Trichoterus coquilletti** Ash. '97b, p. 67-68, ♀, Cal.

Nov.-Dec. Like *polita*.

## (b) Cell basal, against leaf.

**Dryophanta glabra** Gill. '94, p. 237-238, ♀, *Q. undulata*, Colo.: Cockerell, *Q. gambeli*, Colo. 4-6 mm.

*D. eburnea* Bass.

**Dryophanta eburneus** Bass. '90, p. 70-71, ♀, Utah.

**Dryophanta similis** Bass. '90, p. 71, ♀, Utah. Similar to *eburneus*.

*D. simillina* D. T.

(L) Small, thin-walled, globular galls; usually marginal on the leaf and piercing the lamina.

**Andricus utriculus** Bass. '81, p. 78-79 (*Cynips*), ♂ ♀, *Q. alba*, Conn.

June. *Q. alba*, Mass. Marginal; may distort the leaf.

**Neuroterus pallipes** Bass. '90, p. 89, ♂ ♀, *Q. alba*, Mass. Resembles *utriculus*.

**Andricus pruinus** Bass. '00, p. 311-312, ♀, *Q. obtusiloba* Conn. Much like *utriculus*.

**Callirhytis pilula** Bass. '90, p. 77-78, ♀, *Q. undulata* Utah. Globular; piercing lamina.

**Dryophanta porterae** Cockerell '00, p. 91-92, ♀, *Q. undulata*, N. Mex.

Jan. 30. Depressed; spherical; in row along mid-vein.

*D. pulchripennis* Ashm.

**Andricus rileyi** Ash. '97, p. 121-122, ♀, *Q. rubra*, Mo.

July 2. 3 mm. On under side of mid-vein.

\***Neuroterus saltatorius** Edwards '76(?), (*Cynips*), fly, *Q. undulata* (?) Riley. White oaks. Mo.

Small gall; no kernel in centre.

\*(Move to G., p. 15, with which it grades.)

(M) Small galls attached to the leaf-blade, of various structure and peculiar form.

\***Neuroterus verrucarum** O. S. '61, p. 61-62 (*Cynips*), ♀ (?), *Q. obtusiloba*, D. C.

Late summer. Disc-like; hairy.

**Neuroterus umbilicatus** Bass. '00, p. 330-331, ♀, *Q. bicolor*, N. Y.: Beut. Cat. *Q. bicolor*, N. J.:

Beut. '04, *Q. platanoides*, N. Y.

Mass. Disc-like, sessile; central pit, plate 4, 306.

**Andricus foliaformis** Gill. '89, p. 214-215, fig. 1, 221, ♀, *Q. alba*, Mich.

July 30. Succulent, one cell and lobed; rough.

**Andricus parmula** Bass. '00, p. 312, ♀, Cal. Saucer-shaped discs.

**Andricus kingi** Bass. '00, p. 316, ♀, *Q. alba* (?), Cal.

Cone sessile on leaf; hollow with attached cell.

\***Dryophanta pulchripennis** Ash. '97, p. 115-116, ♀, Apr.

Hemispherical, netted surface; beneath leaf.

**Dryophanta discus** Bass. '00, p. 326, ♀, Cal. Disc-like; beneath leaf.

(N) Galls composed apparently of crystalline matter; attached to leaves.

(a) Solitary; globular.

\**Cynips echinus* O. S. '70, p. 56, ♀, *Q. agrifolia*, Cal.

Monothalamous, faceted, scarlet. ("Facets of the surface pointed or spine-tipped.")

Possibly might be assigned to VHB, p. 15.

*Andricus speciosus* Bass. '90, p. 81, ♀, Cal. 3-4 in. crystalline.

*Andricus crystallinus* Bass. '00, p. 319-320, ♀, *Q. agrifolia* (?), Cal.

Conical; of crystalline fibers: see O. S. *echinus*

(b) Clustered; tubular.

*Andricus tubicola* O. S. '61, p. 60 (*Cynips*), ♀, *Q. obtusiloba*, D. C. Oct. (See O. S. '62, p. 250.)

(O) Small, fleshy galls clustered on leaves.

(a) Split mid-vein in their growth.

(?) *Cynips deciduae* Bass. '64, p. 689, *Q. rubra*, Conn.: O. S. '65, p. 360, '61, p. 256, *Q. bicolor*, D. C.; *Q. ilicifolia*, *Q. rubra*, *Q. coccinea*, Mass.; *Q. rubra*, R. I. Seed-like, plate 3, 77.

*Andricus piperoides* Bass. '00, p. 314-315, ♀, *Q. rubra*, Conn. Summer second year before Spring.

Red oaks, Mass. Fuzzy, globular, plate 5, 286.

(b) Do not split mid-vein in growing.

*Cynips dimorphus* Gill. '89, p. 186, 221, *Q. bicolor*, *Q. macrocarpa*, *Q. prinus*. Mich. (*C. dimorphus* Ash. Mss.)

Fly not described. Gall described.

*Zopheroteras vaccinii* Ash. '87, p. 136-137 (*Acraspis*), ♀, *Q. obtusiloba*. (Gall Aug.-Dec.) Fla.

Over winter, Feb.; = O. S. '62, p. 255, *Q. obtusiloba*, D. C.

Urn-shaped gall.

*Cynips nigricens* Gill. '89, p. 217-218, 221, ♀, *Q. bicolor*, Mich.

Clustered below mid-vein. (Internal structure not given.)

(P) Galls attached to leaves and covered with woolly fibers.

(a) Small cells each with a separate crown of wool.

*Neuroterus minutissimus* Ash. '85, p. VII (*Cynips*), ♀, *Q. virens*, Fla.

Spring.

*Neuroterus exiguissimus* Bass. '00, p. 332-333, ♀, *Q. alba*, R. I., Mass., Conn.

*Q. alba*, Mass. Over winters. In row along veins, plate 5, 303.

*N. floccosus* Bass.

(b) Small, seed-like cells in groups and covered by wool.

*Andricus flocci* Walsh '64, p. 482-483, (*Cynips*), ♀, *Q. alba* (?) Ill. Winters; = *Cynips g. lana* Fitch 5 Rept., p. 814-816, fig., fly (*Synergus*) *Q. alba*, N. Y.: O. S. '61, *Q. alba*, *Q. obtusiloba*, D. C.: Beut. Cat. '04, *Q. alba*, N. Y.: Gill. '96, Iowa; Gill. '89, *Q. alba*, *Q. macrocarpa*, Iowa, Mich. Fly in March: Cook '05, *Q. rubra*, *Q. alba*, Ind.: Beach '05, Iowa: Harvard Coll., *Q. alba*, Conn., N. H.

June, Mass. Cells erect beneath the wool. *Q. alba*, R. I., Mass. Gall winters, plate 5, 150.

*Andricus lanigerus* Ash. '81, p. XIII-XIV (*Cynips*), ♀, *Q. virens*, Fla.

2-6 cells erect. (Otherwise like *A. flocci*.)

*Andricus pattoni* Bass. '81, p. 98-99 (*Cynips*), ♀, *Q. obtusiloba*, Conn. Winters. Feb.  
Cells erect under wool.

"*Dryophanta*" *ignota* Bass. '81, p. 106-107 (*Cynips*), ♀, *Q. bicolor*, Conn.: Harvard Coll., *Q. bicolor*, Mass.  
Cells prostrate, wool scanty.

(c) Cells large, not seed-like but clustered under wool as before.

*Neuroterus laurifoliæ* Ash. '87, p. 140-141, ♀, *Q. laurifolia*, Fla.  
3-4 in cluster. Cells, disc-like.

*Andricus infuscatus* Ash. '87, p. 144-145, ♀, *Q. catesbæi*, Fla. Winters. March. Beut. '07,  
*Q. imbricaria*, Ohio, Ill.

Attached by point. Cells 2-10 in.; fleshy; monothalamous; fall to ground.

*Dryophanta lanata* Gill. '91, p. 198-199, pl. IX, fig. 5, ♀, *Q. rubra*, *Q. coccinea*, Iowa, Ill. Winters  
from summer. Summer.

*Q. rubra*, *Q. ilicifolia*, *Q. coccinea*, Mass. Cells large, conical when full-grown; 3-4 in  
cluster, plate 5, 67.

*Dryophanta nubila* Bass. '81, p. 56-57, (*Cynips*), ♀, Ariz.

Wool long; cells 3-16 x 1-2 in.; clustered.

(d) Cells small and bonded together by a hard substance.

*Callirhytis lasius* Ash. '97, p. 132-133, ♀, *Q. chrysolepis*, Cal.  
Dec., Jan. Woolly.

*Bassetia tenuicornis* Bass. '81, p. 92-93 (*Cynips*) ♀, Ariz.

Fall. Cells united by brittle substance and group attached to leaf by one point.

(e) Polythalamous under wool.

(?) *Andricus mexicanus* Bass. '90, p. 78-79, Mex. Sessile, hard; long wool.

(Q) Galls on pedicels; attached to the leaves.

*Amphibolips coelebs* O. S. '61, p. 60-61 (*Cynips*), ♂, *Q. rubra*, D. C. Beut. '04, *Q. rubra*, N. Y.  
(See notes on O. S. '62, p. 6.) June. Long, oval.

*Andricus fusiformis* O. S. '61, p. 61 (*Cynips*), ♀, *Q. alba*, Md., D. C. Provancher '83, ♀ Canada.  
May. Long, oval.

*Andricus chinquapin* Fitch 5 Rept., p. 820 (*Figites*), ♀, *Q. prinoides*, *Q. chinquapin* N. Y.  
May. Oval, minute.

*Andricus capsula* Bass. '81, p. 101-102 (*Cynips*), ♂ ♀, *Q. bicolor*, Conn. June. Oval., plate  
3, 320.

*Dryophanta pedunculata* Bass. '90, p. 72-73, ♂ ♀, *Q. rubra*, *Q. coccinea*, Conn. Globular.

## VI. GALLS OF THE AMENTS:

*Callirhytis pulchra* Bass. '90, p. 73-74, ♂ ♀, *Q. rubra*, *Q. tinctoria*, Mass. May.

*Q. rubra*, Mass. Late May. Fly early June. Green, globular, fleshy, plate 3, 170.

*Andricus blastophagus* Ash. '87, p. 143-144, ♀, *Q. cinerea*, Fla.

May. Small, ovoid, cells.

*Andricus exiguus* Bass. '00, p. 318-319, ♂ ♀, *Q. obtusiloba*, Conn.

May. Oval cells crowded; aments swollen.

*Callirhytis clarkei* Bass. '90, p. 79, ♀, *Q. ilicifolia*, Mass.

Spring, *Q. ilicifolia*, Mass. Florets become oval cells.

*Neuroterus exiguus* Bass. '00, p. 333-334, ♂ ♀, *Q. obtusiloba*, Conn.

Cells hidden among the florets; ament swollen.



- Neuroterus pallidus** Bass. '90, p. 88, ♂ ♀, *Q. bicolor*, Conn.  
Solitary or clustered; 2 mm., globular.
- Neuroterus vernus** Gill. '90, p. 22, ♀, *Q. macrocarpa*, Iowa.  
Aments swell; galls fuzzy. See page 12. Gall on capsules. Fly, May, June.
- Andricus pruinus** Bass. '00, p. 311, ♀, *Q. obtusiloba*, Conn.  
Small, hollow cells like *A. utriculus* galls. (See page 18.)
- Dryophanta palustris** O. S. '61, p. 62, ♂ ♀.  
Succulent, hollow; free central kernel. (See page 14.)
- Andricus congregatus** Ash. '97, p. 120, ♀, *Q. chrysolepis*, *Q. agrifolia*, Cal.  
2 x 4 cm. Irregular, polythalamous, rugose. (See page 8.)
- Andricus turneri** Ash. '81, p. XVI (*Cynips*), ♀, *Q. aquatica*, Fla.  
Apr. 28. Triangular, 2 celled kernels, clustered and very woolly. (Resembles *seminator*.)
- \***Amphibolips trizonata** Ash. '97, p. 125-126, ♂ ♀, Ariz.  
June. Globular, pithy Oak-apple. "Said to grow on the aments."

## VII. GALLS OF THE FRUITS:

## 1. Galls of the acorn—

- Andricus perditor** Bass. '00, p. 313-314, ♀, *Q. ilicifolia*, Conn.  
*Q. ilicifolia*, Mass. Acorn aborted and becomes a gall, plate 4, 247.
- Callirhytis fruticola** Ash. '97, p. 131-132, ♀, Apr. 5; = Murdtfelt Insect Life, 6, p. 322, *Q. tinctoria*, Mo.  
Cells in pulp of acorn.

## 2. Galls of the acorn-cup (cupule)—

- Callirhytis operatola** Riley '73, p. 519, (Mss.), Opposite sex *C. operator*: Bass. '73, p. 91, Bass. '00, p. 315-316, ♀, *Q. ilicifolia*, Conn.  
*Q. ilicifolia*, Mass. Between cup and acorn. (See *C. operator*, page 11.)
- (?) **Cynips glandulosus** Riley '77, p. 577-578, *Q. alba*, *Q. prinoides*, *Q. michauxii*, *Q. prinus*, *Q. bicolor*, *Q. muhlenbergii*, Pa., Mo. Packard, Pa.  
*Q. prinoides* and *Q. alba*, Mass. In cupule; seed kernel, plate 4, 278.
- Amphibolips prunus** Walsh '64, p. 104, note, figs. 80 and 81 (*Cynips*), ♀, *Q. nigra*, *Q. rubra*, Ill.  
Aug., Sept. Apr. often of second year. Beut. '04, *Q. rubra*, N. Y.: Gill. '89, *Q. nigra*, Iowa, *Q. rubra*, Mich.; fly, June 25: Lintner '88, N. Y.: Beut. Cat., *Q. rubra*, *Q. tinctoria*, N. Y.: Cook '05, Ind.  
*Q. rubra*, Mass., R. I. Fleshy on cupule, plate 2, 304.
- Amphibolips gainesi** Bass. '00, p. 322, ♀, *Q. tinctoria* (?), Tex. Like *prunus*.
- (?) **Cynips juglans** O. S. '62, p. 255-256, *Q. alba* (?), Md., D. C. Like *prunus*.
- Andricus calycicola** Ash. '87, p. 141, ♀, *Q. laurifolia*, Fla. Winters. Feb.  
Hard capsule usually in bud. (See page 11.)

GALLS ON ROSE (*Rosa*)

## I. ON THE ROOTS:

- Rhodites radicum** O. S. '63, p. 42, 46-47, ♂ ♀, Conn.; = *Cynips semipicea* Harris '41, p. 400, ♀ (*Periclistes*), Mass.: Beut. '04, N. Y.: Harvard Coll., *R. carolina*, Mass.: Gill. '92 p. 247, Colo.: Cook '05, *Rosa carolina*, Ind.: Webster '92, Ohio: Saunders '74, Canada.
- Tribalia batatorium** Walsh '64, p. 470-472, ♀, "Potato (?)." Ill. Provancher (Add. and Corr., p. 161).  
Fleshy, polythalamous gall.  
*Rhodites radicum* O. S.
- \***Rhodites utahensis** Bass. '90, p. 62-63, ♂, Utah.  
May be only near ground and not beneath soil surface.

## II. GALLS OF THE STEMS:

## (A) Mossy—

- Rhodites rosæ** Linn. Syst. Nat. Ed. 10, 1758, vol. 1, p. 533 (*Cynips*), ♀: O. S. '63, p. 40–41, 47, ♂ ♀, N. Y., Conn. Emerges May: Riley '68, N. Y.: Riley '70, N. Y.: Riley '80, Ga.: Comstock "Manual Insects," Sweet-briar: Provancher, Quebec: Harvard Coll., *R. rubiginosa*, N. Y., Mass.: Beut. Cat., *Rosa carolina*, *R. villosa*, N. Y.: Beut. '04, *R. rubiginosa*, N. Y.: Ash. '87b, Canada.  
*Rosa rugosa*, *R. blanda*, *R. cinnamomea*, Mass., R. I. Gall winters; fly May–June, plate 5, 92.

## (B) Swellings at tips of twigs—

- Rhodites globulus** Beut. Cat. '92, p. 247, pl. IX, fig. 4, ♂ ♀, *Rosa carolina*, N. Y.; = O. S. '63, Gall No. 5, p. 42, Conn.: Cook '05, '95, *R. carolina*, Ind.: Harvard Coll., N. Y., Mass., Conn.  
 R. I., Mass. Oval, abrupt.  
*R. globuloides* Beutm.
- \***Rhodites variabilis** Bass. '90, p. 61–62, ♂ ♀, Utah.  
 Reniform; also on leaves.
- Rhodites tumidus** Bass. '90, p. 60–61, ♂ ♀, Utah.  
 Branch becomes a cone covered with bract-like leaves.
- \***Rhodites similis** Ash. '97, p. 136, ♂ ♀, Wyo.  
 Like *variabilis*.  
*R. arefactus* Gill.

## (C) Swellings of stems which are typically not terminal in position—

- Rhodites dichlocerus** Harris '41, p. 399–400 (*Cynips*), fly, Mass.: O. S. '63, p. 44, 46, ♂ ♀, N. Y., Conn.: Beut. Cat. and '04, *R. carolina*, N. Y.: Cook '05, *R. carolina*, Ind.: Harvard Coll., Mass., N. Y.: Ash. '87, Fla. April.  
*Rosa nitida*, *Rosa* species, *R. canina*, Mass., R. I. Fly early June; gall winters. Oval, gradual enlargement of stem, plate 5, 112.
- Rhodites verna** O. S. '63, p. 41, 47–48, ♂ ♀, D. C.: Harvard Coll., *R. rubiginosa*, D. C.: Beut. Cat., *R. lucida* N. Y.  
 Small, oval swellings.
- Rhodites tuberculosa** O. S. "Stettin," p. 415 (*Cynips*, *Rhodites*?), ♂ ♀, D. C. Species doubtful. Neither O. S. nor other writers refer to it again and it is very imperfectly characterized. May be *Rh. verna*.
- Rhodites arefactus** Gill. '94, p. 157–158, ♂ ♀, Colo., May 23.  
 Corky enlargements at base of branches.
- Rhodites neglecta** Gill. '94, p. 158–159, ♂ ♀, Colo., May 17.  
 Abrupt swelling. (Polythalamous; 15 x 18 mm.)
- Rhodites multispinosa** Gill. '90, p. 25, fig. 2, ♂ ♀, Iowa; = Bull. Iowa Exper. Sta. *Rh. spinosissima*. (Preoccupied.)  
 Abrupt swelling; very spinose.
- Rhodites fusiformans** Ash. '90, p. 14, ♂ ♀, *R. arkansana* Colo.: Gill. '92, Colo.  
 Irregular swelling.

## III. GALLS OF THE LEAVES:

## (A) Galls in the parenchyma—

- Rhodites lenticularis** Bass. '90, p. 59–60, ♂ ♀, *Rosa lucida*, Mass.: Beut. '04, p. 8, *R. lucida*, N. Y.  
 Disc-like thickenings.  
*R. rosafoliae* Ashm.

## (B) Galls attached to the leaves—

**Rhodites bicolor** Harr. '41, p. 399 (*Cynips*), fly, Mass.; = *Rh. tumidus*, Townsend, Psyche '95, p. 272, 307; O. S. '63, p. 43, 48-49, ♂ ♀, Conn.: Harvard Coll., Ottawa, Ala., Mass.: Gill, '92, Colo.: Beut., N. Y.: Provancher, vol. 2, p. 160, Quebec: Cook '05, Ind.: Riley '70, Miss.: Harvard Coll., *R. lucida*, Me., *R. rubiginosa*, Montreal, Cal., Conn.: R. I., Mass. Gall over winters. Globular, spinose, plate 5, 5.

\***Rhodites gracilis** Ash. '97, p. 135-136, ♂ ♀, Mich. and Iowa. (?) May 7.

Gall subglobose, with crown of irregular spines, diameter 2-3 mm. On *R. blanda*, *R. lucida*.

**Rhodites polita** Ash. '90, p. 14, ♂ ♀, *Rosa californica*, Cal., Colo., Dakota: Gill. '93, Colo.: Ash. '96, Colo., Wyo.

Globular; not spiny.

**Rhodites nebulosus** Bass. '90, p. 63-64, ♂, *R. carolina*, *R. blanda*, 3-16 in., globular.

**Rhodites ignota** O. S. '63, p. 43-44, 49, ♂ ♀, *R. carolina*, Md., Conn. Late May. Harvard Coll., Conn., Mass.: Beut., *R. carolina*, N. Y.: Gill. '92, Colo.; Ash. '86, '87, Fla.: *Rosa nitida*, Mass. Over winters. Fly May. Oval, white bloom, hard, plate 5, 100.

**Rhodites carolina** Ash. '87, p. 133, 148, ♀, *R. carolina*, N. C.

Like *ignota* but monothalamous.

**Rhodites rosæfoliæ** Ash. '90, p. 13-14, ♀, *R. arkansana*, Colo.: Gill. '90, Colo.

Small, disc-like; on leaves.

**Rhodites variabilis** Bass. '90.

Reniform; on twigs and leaves. (See page 22.)

GALLS ON CINQUE-FOIL (*Potentilla*)

**Gonaspis potentillæ** Bass. '64, p. 689-690 (*Diastrophus*), ♂ ♀, *P. canadensis*, Mass., Conn. Late May. Beut. Cat. '04, N. Y., N. J.

*P. canadensis*, Mass., R. I. Over winters. Globular in axils, plate 3, 63.

**Diastrophus minimus** Bass. '00, p. 325-326, ♂ ♀, *P. canadensis*, Mass.

Blisters on stems.

**Diastrophus niger** Bass. '00, p. 324-325, ♂ ♀, *P. canadensis*, *Fragaria* (?), Mass. Early June.

*P. canadensis*, Mass. Over winters. Stem swollen, plate 8, 83.

**Diastrophus fusiformans** Ash. '90, p. 13, ♀, Colo.

Slight stem swelling.

GALLS ON RASPBERRY OR BLACKBERRY (*Rubus*)

## 1. ON THE ROOTS:

**Diastrophus radicum** Bass. '70, p. 98-99, ♂ ♀, *R. villosus*, Conn.: Gill. '89, Raspberry, Mich.; fly, late May: Beut. '04, *R. occidentalis*, N. Y.:

*Rubus strigosus*, *R. canadensis*, Mass., R. I. Irregular in size, plate 5, 155.

## 2. AT THE CROWN:

**Diastrophus bassetti** Beut. Cat. '92, p. 248-249, pl. 9, fig. 7, ♂, *R. canadensis* (?), N. J.: Beut. '04, *R. canadensis*, N. Y.:

*R. canadensis*, R. I., Mass. Globular; near ground, plate 3, 99.

## 3. ON STEMS:

## A. Mossy excrescences—

**Diastrophus cuscuteformis** O. S. '63, p. 39-40, ♂ ♀, "Blackberry," Md.: Harvard Coll., *R. villosus*, Md., Mass.: Beut. '04, N. Y.: Cat., *R. villosus*, N. J.: Ash. '96, Nebr.: Cook '05, *R. villosus*, Ind.: Walsh '64, Ill.: Webster, Ohio.

*R. villosus*, Mass., R. I. Over winters. Fly, late in May, plate 5, 115.

*B. Swellings of the stem—*

- Diastrophus nebulosus** O. S. "Stettin," p. 415 (*Cynips*, *Diastrophus* (?)), ♀, *R. villosus*, D. C.: O. S. '63, p. 36–39, ♂ ♀, *R. villosus* (?), D. C.: Harvard Coll., Raspberry, Quebec, Mass., *R. villosus*, Mass.: Provancher, *R. vitis-idaea*, Quebec: Ash. '86, *R. villosus*, Fla.: Beut., *R. villosus*, N. J., N. Y.: Cook '05, *R. villosus*, Ind.: Riley '70, Mo.: Riley '68, Ohio: Webster '92, Ohio:  
*R. villosus*, R. I., Mass.; *R. strigosus*, Mass.; over winters; fly, late May, plate 5, 117.
- Diastrophus turgidus** Bass. '70, p. 99–100, ♀, *R. strigosus*, Conn.  
*R. strigosus*, Mass. Over winters. All around stem, plate 5, 85.
- Diastrophus kincaidii** Gill. '93b, p. 110, ♂ ♀, *R. nutkanus*, Wash.

## COMPOSITÆ

GALLS ON WILD LETTUCE (*Lactuca-Mulgedium*)

1. No visible gall, merely larval cells in the pith:  
**Aulacidea mulgedicola** Ash. '97, p. 133 (*Aulax*), ♂ ♀, *M. acuminatum*, D. C. Jan., Feb.  
*Aulacidea bicolor* Gill.<sup>1</sup>
2. Swellings of the stem:  
*A. Not pithy—*  
**Aulax podagræ** Bass. '90, p. 91–92, ♂ ♀, *L. canadensis*, Conn.  
*Lactuca*, Mass., R. I. Over winters. Fly, May, plate 2, 116.  
*Aulacidea*.
- B. Pithy—*  
**Aulax tumida** Bass. '90, p. 92, ♂ ♀, Conn. Beut., *L. canadensis*, N. Y.  
Mass. Over winters. Fly in May, plate 5, 133.  
*Aulacidea podagræ* Bass.
- \***Antistrophus leavenworthii** Bass. '00, p. 310, ♂ ♀, Va. Over winters. Spring.  
*Aulax*.

GALL ON GOLDEN-ROD (*Solidago*)

- Aulacidea solidaginis** Girault '03, p. 323–324, fig. ♂ ♀, *S. species*, Va. Over winter. June 2–8.  
Stem swollen.  
*Aulacidea tumida* Bass.

## GALL ON PRENANTHES

- Aulax nabali** Brodie '92, p. 12–13, ♂ ♀, *Nabalus altissimus*, Toronto. Winters.  
*P. serpentaria*, Mass. Over winters. Fly, late May.  
*Aulacidea*.

## GALL ON SONCHUS

- Aulax sonchicola** Ash. '97, p. 134, ♂ ♀, *S. oleraceus*, Can., N. C. June.  
Abrupt swelling at top of stalks.  
*Aulacidea tumida* Bass.

GALL ON DANDELION (*Taraxacum*)

- Gilletia taraxaci** Ash. '97b, p. 69, ♂ ♀, *T. dens-leonis*, Minn.  
Mar. 31. Petiole swollen.  
*Aulax*.

<sup>1</sup> The synonymy in *Aulax* and *Aulacidea* is that of Beutenmuller, 1910, Am. Mus. Nat. Hist. Bul. 28:137–44, 253–58.

## GALL ON SILPHIUM

A. Cells in the pith; no gall—

*Aulax rufus* Gill. '91, p. 195–196, pl. 9, fig. 4 (*Antistrophus*), ♂ ♀, Ill.

*S. laciniatus* (?), *S. perfoliatum*, *S. terebinthinaceum*, *S. integrifolium*).

*Antistrophus minor* Gill. '91, p. 196, ♀, *S. laciniatum*, Ill.

*Aulax gillettei* Kieff.

B. Gall, abrupt swelling at tip of stalks—

*Aulax silphii* Gill. '91, p. 192–194, pl. 9, fig. 1–2 (*Antistrophus*), ♂ ♀, *S. integrifolium*, *S. perfoliatum*. Ill. Winters. May–June.

*Aulax leavenworthii* Bass.

C. Gall on the receptacle of flower-head—

*Antistrophus laciniatus* Gill. '91, p. 194–195, pl. 9, fig. 3, ♂ ♀, *S. laciniatum*, Ill.

*Aulax*.

## GALL ON AMBROSIA

*Aulax ambrosiæcola* Ash. '97, p. 134–135, ♂ ♀, *Ambrosia* species. Mo. Cells in pith (?).

*Aulacidea*.

## GALL ON LYGODESMIA

*Antistrophus pisum* Walsh '70, p. 73–74, fig. 47, ♂ ♀, *L. juncea*, Neb. Winters. Mid-May.

Gill. '89, *L. juncea*, Colo.

Pea-shaped on stem.

*Aulax*.

## ERICACEÆ

GALL ON VACCINIUM (*Gaylussacia*)

*Solenozophoria vaccinii* Ash. '87, p. 149, ♀, Huckleberry, Fla. Winters. Late Feb. O. S.

"Stettin," p. 416, *Gaylussacia dumosa*, D. C.

Low and high-bush blueberry, Mass. Winters. Reniform; on twigs, plate 3, 34.

## ASCLEPIADALES

## GALL ON STEPHANOTIS

*Asclepiadiphila stephanotis* Ash. '97c., p. 263, ♂ ♀, *Stephanotis* species, Ore., Mo.

Monothalamous; pea-shaped on stem.

*Aulax pisum*

## LABIATÆ

## GALL ON NEPETA

*Liposthenus glechomæ* Linn. 10 ed. Syst. Nat. (*Cynips*), *N. hederacea*, Hartig. 1841 (*Aulax*);

♀ = *Diastrophus similis* Bass. '81, p. 95–96, ♀. *N. glechoma*, N. Y. (See Mayr 1902.)

Globular, axillary. Introduced.

*Aulax*



## PART II. CLASSIFICATION BY GENERA

## CYNIPS (Hartig '40)

	FIRST DESCRIPTION	SYNONYMY, HOSTS
<i>q. aciculata</i>	O. S. '61, p. 56	♀ = <i>Amphibolips confluentus</i> . (Fall generation.)
<i>affinis</i>	Bass. '81, p. 103	♂ ♀ = <i>Neuroterus vesiculus</i> .
<i>q. agrifoliæ</i>	Bass. '81, p. 53	♀ = <i>Callirhytis</i> (Mayr '81). ( <i>O. S. strobilana</i> .)
<i>q. aquaticæ</i>	Ash. '81, p. XVI	♂ ♀ = <i>Dryophanta</i> .
<i>q. arbos</i>	Fitch 5 Rept., p. 809	fly = <i>Callirhytis clavula</i> . Bass: fly is a <i>Ceroptres</i> .
<i>batatus</i>	Fitch 5 Rept., p. 810	♀ = <i>Neuroterus</i> (Mayr '81).
<i>q. batatoides</i>	Ash. '81, p. X	♀ = <i>Andricus</i> (Ash. '85).
<i>bella</i>	Bass. '81, p. 93	♀ = <i>Dryophanta</i> (Dalla Torre, Cresson. Mayr '81) ( <i>Andricus</i> Ash.).
<i>bicolor</i>	Harr. '41, p. 399	♀ = <i>Rhodites</i> (O. S. '63).
<i>q. californica</i>	Bass. '81, p. 51	♀ = ( <i>Callirhytis</i> Cresson, Ash. '87) ( <i>Andricus</i> Mayr) (Both <i>Andricus</i> and <i>Callirhytis</i> Ash. '85).
<i>q. capsuala</i>	Ash. '85, p. IX	♀ = <i>Andricus</i> (Ash. '87).
<i>capsula</i>	Bass. '81, p. 101-102	♂ ♀ = ( <i>Callirhytis</i> Ash.) ( <i>Holcaspis</i> Cresson) ( <i>Andricus</i> Mayr).
<i>q. catesbæi</i>	Ash. '81, p. XV	♂ ♀ = <i>Neuroterus</i> .
<i>q. centricola</i>	O. S. '61, p. 58	♀ = <i>Holcaspis</i> .
<i>cicatricula</i>	Bass. '81, p. 101	♂ ♀ = <i>Andricus</i> .
<i>q. cinerea</i>	Ash. '81, p. XIX	♀ = <i>Amphibolips</i> .
<i>cinerosa</i>	Bass. '81, p. 110	<i>Holcaspis</i>
<i>q. citriformis</i>	Ash. '81, p. XXVIII	♀ = <i>Andricus</i> (Ash. '85).
<i>chrysolepidicola</i>	Ash. '97, p. 124	♀ = <i>Amphibolips</i> .
<i>q. clavigera</i>	Ash. '81, p. XXVI	♀ <i>Q. chrysolepis</i> . Cal. Winters. Jan., Feb. Stem swollen.
<i>clavula</i>	Bass. '64, p. 685 tuber O. S. '65, p. 351	♀ = <i>Callirhytis</i> ( <i>Andricus</i> Ash. '87, '85).
<i>q. confluentus</i>	Harris '41, p. 397	♀ = <i>Callirhytis</i> Mayr. No description, only name proposed.
<i>q. coelebs</i>	O. S. '61, p. 60	♂ ♀ = <i>Amphibolips</i> .
<i>q. coccineæ</i>	O. S. '62, p. 243	♂ = <i>Amphibolips</i> .
<i>q. confusa</i>	Ash. '81, p. XVIII	♀ = <i>Amphibolips confluentus</i> .
<i>q. conifera</i>	Ash. '81, p. XXVII	♀ = <i>Dryophanta</i> .
<i>cornigera</i>	O. S. '62, p. 251	♀ = <i>Andricus</i> (Ash. '87).
<i>corrugis</i>	Bass. '81, p. 109	♀ = <i>Callirhytis</i> (Ash. '85).
<i>coxii</i>	Bass. '81, p. 112	♀ = <i>Holcaspis</i> .
(?) <i>decidua</i>	Bass. '64, p. 689	♀ = <i>Andricus</i> (Ash. '85).
<i>dichlocerus</i>	Harr. '41, p. 399	<i>Q. bicolor</i> and Red oaks, Conn., R. I., Mass., D. C. Seed-like on leaf.
<i>dimorphus</i>	Gill. '89, p. 186	♂ ♀ = <i>Rhodites</i> (O. S. '63).
		♀ (n. d.) <i>Q. prinus</i> , <i>Q. macrocarpa</i> Mich. <i>Q. bicolor</i> . Small, fleshy; clustered on leaf.

q. echinus	O. S. '70, p. 56	♀ Q. agrifolia, Cal. Globular, crystalline on leaf.
q. erinacei	Walsh '64, p. 483	♀ (n. d.) = <i>Acraspis</i> (Mayr '81).
q. ficigera	Ash. '85, p. V	♀ = <i>Holcaspis</i> .
q. ficus	Fitch 5 Rept., p. 812	♀ Gall = <i>Xanthoteras forticornis</i> ; fly is a <i>Ceroptres</i> . <i>Biorhiza forticornis</i> Walsh
q. ficula	Bass. '81, p. 75	♀ = <i>Holcaspis spongiosa</i> Bass.
flavicollis	Ash. '97, p. 123	♀ Ill. (?) Gall unknown.
q. flocci	Walsh '64, p. 482	♀ = <i>Andricus</i> (Mayr '81).
floccosa	Bass. '81, p. III	♀ = <i>Neuroterus</i> (Mayr '81).
q. foliata	Ash. '81, p. XII	♀ = <i>Andricus</i> (Ash. '85).
q. formosa	Bass. '64, p. 679	♀ = <i>Andricus</i> (Cresson, Ash. '87). <i>Amphibolips</i> (Ash. '85).
q. forticornis	Walsh '64, p. 489	♀ = <i>Xanthoteras</i> (Ash. '97b). <i>Biorhiza</i>
(?) q. frondosa	Bass. '64, p. 688-689	Q. prinoides, Mass., Conn., D. C., Mo. Winters from June. June. Bud capsule and rosette of leaves.
(?) q. frondosa	Walsh '70, p. 72-73	Q. alba and Q. macrocarpa, Ill. Winters. Like above.
q. fuliginosa	Ash. '85, p. VII	♀ = <i>Amphibolips</i> (Ash. '85).
q. fusiformis	O. S. '61, p. 61	♀ = <i>Andricus</i> (Ash. '85).
q. futilis	O. S. '61, p. 63	♂ = <i>Callirhytis</i> (Mayr).
q. gemmaria	Ash. '85, p. IX	♀ = <i>Andricus</i> (Ash. '85).
q. gemula	Bass. '81, p. 104	♂ ♀ = <i>Dryophanta</i> (Mayr '81).
(?) glandulosus	Riley '77, p. 577-578	Q. alba and Q. prinus groups of oak. Mo., Mass., Pa. Forms in summer and over winters. (?) Seed-like capsule in acorn-cup.
q. hirta	Bass. '64, p. 687	♀ = <i>Biorhiza</i> (Ash. '85).
ignota	Bass. '81, p. 106	♀ = <i>Andricus</i> (Mayr '81). <i>Dryophanta</i> (Dalla Torre, Ash., Cresson).
ilicifoliæ	Bass. '64, p. 681	♂ ♀ = <i>Amphibolips</i> (Ash. '85).
q. inanis	O. S. '61, p. 58	♀ = <i>Amphibolips</i> (Ash. '85).
q. irregularis	O. S. '61, p. 65	♂ = <i>Neuroterus</i> (Ash. '85).
q. juglans	O. S. '62, p. 255-256	Q. alba, Md., D. C. Fleshy; on cupule.
q. lana	Fitch 5 Rept., p. 814	fly, Gall = <i>Andricus flocci</i> ; fly is a <i>Synergus</i> .
q. lanigera	Ash. '81, p. XIII	♀ = <i>Andricus</i> (Ash. '85).
q. majalis	Bass. '64, p. 682	♂ ♀ = <i>Neuroterus</i> (Mayr) = <i>Dolichostropus</i> (Ash.).
q. mamma	Walsh '69, p. 102	♀ (?) = <i>Holcaspis</i> .
q. mammula	Bass. '81, p. 76	♂ ♀ = <i>Loxaulus</i> (Mayr '81).
q. medullæ	Ash. '85, p. VIII	♀ = <i>Andricus</i> (Ash. '85).
(?) mellaria	Riley Amer. Ent. 3, p. 298	Q. undulata, Colo. (?) Subglobular twig bullet-gall. <i>Holcaspis perniciosus</i> Bass.
minuta	Bass. '81, p. 96	♂ ♀ = <i>Neuroterus</i> .
q. minutissima	Ash. '85, p. VII	♀ = <i>Neuroterus</i> .
q. modesta	O. S. '61, p. 65	♀ = <i>Callirhytis</i> (Ash. '85).
nebulosus	O. S. "Stettin," p. 415 ( <i>Diastrophus</i> )	♂ ♀ = <i>Diastrophus</i> (O. S. '63).

<i>nigræ</i>	O. S. '61, p. 66	♂ ♀ = <i>Callirhytis</i> (Ash. '85).
<i>nigricens</i>	Gill. '89, p. 217-218, 221	♀ <i>Q. bicolor</i> , Mich. Summer. Late fall. Cone-shaped; clustered on leaves.
<i>q. notha</i>	O. S. '70, p. 55	♂ ♀ (?) = <i>Dryophanta palustris</i> .
<i>noxiosa</i>	Bass. '81, p. 108	♂ ♀ = <i>Neuroterus</i> (Mayr '81).
<i>nubila</i>	Bass. '81, p. 56	♀ = <i>Dryophanta</i> (Mayr '81).
<i>q. nubilipennis</i>	Harr. '41, p. 398	♂ ♀ = <i>Amphibolips</i> (Ash. '85).
<i>q. omnivora</i>	Ash. '85, p. VI	♀ = <i>Holcaspis</i> .
<i>q. osten-sackenii</i>	Bass. '63, p. 327	♂ ♀ = <i>Andricus</i> (Mayr '81).
<i>q. operator</i>	O. S. '62, p. 256	♂ = <i>Callirhytis</i> (Mayr '81).
<i>q. operatola</i>	Bass. '73, p. 91	♀ = <i>Callirhytis</i> . Agamous generation of <i>C. operator</i> .
<i>q. palustris</i>	O. S. '61, p. 62	♂ ♀ = <i>Dryophanta</i> or <i>Callirhytis</i> . (See <i>Callirhytis</i> .)
<i>q. papillatus</i>	O. S. '61, p. 64	♂ = <i>Callirhytis</i> (Ash. '85).
<i>q. papula</i>	Bass. '81, p. 107	♀ = <i>Dryophanta</i> .
<i>pattoni</i>	Bass. '81, p. 98	♀ = <i>Andricus</i> (Ash. '85).
<i>q. petiolicola</i>	Bass. '63, p. 324	♂ ♀ = <i>Andricus</i> (Mayr '81).
<i>pezomachoides</i>	O. S. '62, p. 250	♀ = <i>Acraspis</i> (Mayr '81) <i>Philonix</i>
<i>q. phellos</i>	O. S. '61, p. 70	♀ (?) = <i>Andricus clavula</i> ( <i>Neuroterus</i> Ash. '87, Cresson).
<i>q. pilulæ</i>	Walsh '64, p. 481	= <i>Cecidomyid</i> gall. <i>Cincticornia</i>
<i>piger</i> "( <i>pigra</i> )"	Bass. '81, p. 105	♀ = <i>Andricus</i> .
<i>q. pisum</i>	Fitch 5 Rept., p. 818	♀ = <i>Acraspis pezomachoides</i> . <i>Philonix</i>
<i>q. pomiformis</i>	Bass. '81, p. 74	♀ = <i>Andricus</i> .
<i>q. podagræ</i>	Walsh '64, p. 323	♀ = <i>Callirhytis punctatus</i> .
<i>prinoides</i>	Beut. Cat., p. 257-258	♀ <i>Q. prinoides</i> , N. J. Late summer. (?) Globular, pointed facets on leaf. <i>Philonix</i>
<i>prunus</i>	Walsh '69, p. 104, fig. 80, 81	♀ = <i>Amphibolips</i> .
<i>q. punctatus</i>	Bass. '63, p. 323	♀ = <i>Callirhytis</i> (Mayr '81).
<i>q. racemaria</i>	Ash. '81, p. XXVI	♀ = <i>Amphibolips</i> .
<i>rileyi</i>	Bass. '81, p. 149	♀ = <i>Neuroterus</i> (Mayr '81).
<i>rugosa</i>	Bass. '81, p. 100	♀ = <i>Holcaspis</i> (Mayr '81). <i>H. globulus</i> Fitch
	(Ash. '81, p. XVIII)	♀ = <i>Andricus</i> .)
<i>seminator</i>	Harr. '41, p. 399	♂ ♀ = <i>Callirhytis</i> (Mayr '81).
<i>q. scitula</i>	Bass. '64, p. 683	♂ ♀ = <i>Callirhytis</i> (Mayr '81).
<i>q. sculptus</i>	Bass. '63, p. 324	♂ ♀ = <i>Amphibolips</i> .
<i>q. similis</i>	Bass. '64, p. 685	♂ ♀ = <i>Callirhytis</i> (Mayr '81).
<i>q. singularis</i>	Bass. '63, p. 326	♂ ♀ = <i>Andricus</i> (Mayr '81).
<i>q. spongifica</i>	O. S. '62, p. 244	♂ ♀ = <i>Amphibolips confluens</i> .
<i>strobilana</i>	O. S. '62, p. 254	♀ = <i>Q. bicolor</i> , <i>Q. palustris</i> , <i>Q. macrocarpa</i> , Mass., N. Y., Mich., Pa., Md., Mo. Cluster on twigs.
<i>q. suttonii</i>	Bass. '81, p. 54	♀ = <i>Callirhytis</i> (Mayr '81).
<i>q. succinipes</i>	Ash. '81, p. XI	♀ = <i>Holcaspis</i> .
<i>tenuicornis</i>	Bass., '81, p. 92	♀ = <i>Bassetia</i> (Ash. '87).
<i>q. tuber</i>	Fitch 5 Rept., p. 806	♀ = (?) <i>Neuroterus batatus</i> ; fly is a <i>Ceroptres</i> .

<b>tuberculosa</b>	O. S. "Stettin," p. 415	♂ ♀ = <i>Rhodites vernus</i> O. S. Rhodites (?)
<b>q. tubicola</b>	O. S. '61, p. 60	♀ = <i>Andricus</i> (Mayr '81).
<b>q. turneri</b>	Ash. '81, p. XVI	♀ = <i>Andricus</i> (Ash. '85).
<b>tumifica</b>	O. S. '65, p. 356	♂ ♀ = <i>Callirhytis</i> (Mayr '81).
<b>q. utricula</b>	Bass. '81, p. 78	♂ ♀ = <i>Andricus</i> (Ash. '85).
<b>q. ventricosa</b>	Bass. '64, p. 681	♀ = <i>Andricus</i> (Ash. '85).
<b>q. verrucarum</b>	O. S. '61, p. 61	♀ = <i>Neuroterus</i> .
<b>vesicula</b>	Bass. '81, p. 97	♂ ♀ = <i>Neuroterus</i> (Mayr '81).
<b>q. virens</b>	Ash. '81, p. IX-X	♀ = <i>Andricus</i> (Ash. '85).
<b>washingtonensis</b>	Gill. '94, p. 235	♀ <i>Q. garryana</i> Wash. Small galls clustered on twigs.

## ANDRICUS s. g. CALLIRHYTIS

<b>sulcatus</b>	Ash. '97, p. 123	♀ <i>Q. virens</i> , Ariz. Spring. Rounded on petiole.
<b>agrifoliæ</b>	Bass. '81, p. 53 (Cynips)	♀ <i>Q. agrifolia</i> , Cal. Dec. Globular bullet-gall. (3-4 in.)
<b>aquaticæ</b>	Ash. '87b, p. 144	♀ <i>Q. aquatica</i> , Fla. Spring, Excentric swelling on twig.
<b>cellæ</b>	Ash. '87b, p. 141	♀ <i>Q. laurifolia</i> , Fla. Swelling along mid-vein.
<b>ceropteroides</b>	Bass. '00, p. 324	♀ <i>Q. tinctoria</i> , Conn. Cells near new growth in old wood of twigs.
<b>clavula</b>	Bass. '64, p. 685 ( <i>C. tuber</i> ), O. S. '65, p. 35 O. S. '61, p. 70	♀ <i>Q. alba</i> , S. N. E., Iowa, Pa., Mo., N. Y., Mich., D. C. Summer. Late fall. Monothalamous club-gall.
<b>clarkei</b>	Bass. '90, p. 79	♀ <i>Q. ilicifolia</i> , Mass. Spring. Aments become mass of cells.
<b>cornigera</b>	O. S. '62, p. 251 (Cynips) O. S. '65, p. 358	♀ <i>Q. palustris</i> , <i>Q. imbricaria</i> , <i>Q. rubra</i> , <i>Q. nigra</i> , <i>Q. ilicifolia</i> . Conn., Mass. Mich., N. Y., D. C., Mo. Forms in spring. Potato-gall with projecting tubes.
<b>crassicornis</b>	Ash. '97, p. 130 F. Can. vol. 2, p. 548	♀ <i>Quercus</i> sp. Imbedded in twig. Conical bullet-gall.
<b>fruticola</b>	Ash. '97, p. 131	♀ <i>Q. tinctoria</i> , Mo. Winters. Early Apr. Cells in pulp of acorn.
<b>futilis.</b>	O. S. '61, p. 63 (Cynips)	♂ <i>Q. alba</i> , <i>Q. stellata</i> , Mass., N. Y., D. C., Conn., Mich. Late spring. July. Round gall (2-3 cells) in tissue of leaf.
<b>lasius</b>	Ash. '97, p. 132	♀ <i>Q. chrysolepis</i> , Cal. Winter. Cells on leaf under wool and bound together.
<b>modesta</b>	O. S. '61, p. 65 (Cynips)	♀ <i>Q. rubra</i> , D. C. Late June. Round gall in tissue of leaf.
<b>nigræ</b>	O. S. '61, p. 66 (Cynips)	♂ ♀ <i>Q. nigra</i> , <i>Q. rubra</i> , D. C. Late June. Swelling of mid-vein by hard matter.

<b>operator</b>	O. S. '62, p. 256 (Cynips)	♂ ♀	<i>Q. nigra</i> , <i>Q. ilicifolia</i> , <i>Q. palustris</i> , Mass., R. I., Conn., D. C., Ill. Mid-May. June. Cells and wool on twigs in spring.
<b>operatola</b>	Bass. '73, p. 91, '00, p. 315 Riley '73, p. 519	♀	<i>Q. ilicifolia</i> , Mass., Conn. Late summer. Spring. Cells in acorn-cup. Agamous gall of operator.
<b>papillatus</b>	O. S. '61, p. 64 (Cynips)	♂	<i>Q. prinus</i> , <i>Q. coccinea</i> , Conn., Mass., N. Y., D. C., Mich. Late spring. Late June. Round gall in tissue of leaf.
<b>parvifoliæ</b>	Ash. '87b, p. 138	♀	<i>Q. parvifolia</i> , Fla. Abrupt gall on mid-vein.
<b>pilula</b>	Bass. '90, p. 77	♀	<i>Q. undulata</i> , Utah. Globular, thin-walled gall on leaf margin.
<b>pulchra</b>	Bass. '90, p. 73	♂ ♀	<i>Q. rubra</i> , <i>Q. tinctoria</i> , Mass. Late May. Early June. Globular, green, fleshy; on aments.
<b>punctatus</b>	Bass. '63, p. 323 (Cynips)	♀	Red and Black oaks, N. Y., Mich., Ill., Conn., Mass. Winters. Apr. Potato-gall.
<b>pusulatoides</b>	Bass. '90, p. 74	♀	<i>Q. coccinea</i> , Conn. Globular, hollow, free kernel.
<b>palustris</b>	O. S. '61, p. 62 (Cynips)	♂ ♀	Various oaks especially red group, Mass., R. I., Conn., Canada, Ill., Ind., N. Y., D. C. Early spring. Late May. Globular, hollow, free kernel.
<b>radicis</b>	Bass. '89b, p. 237	♀	<i>Dryohhanta</i> <i>Q. alba</i> , Conn. Spring root blister gall.
<b>reticulata</b>	Bass. '90, p. 74	♀	<i>Q. virens</i> (?), N. Mex. Abrupt gall on mid-vein.
<b>rhizoxenus</b>	Ash. '97, p. 132	♀	<i>Q. virens</i> , Ariz. June, July. Root gall.
<b>ruginosus</b>	Bass. '90, p. 75	♀	<i>Q. virens</i> (?), N. Mex. Twig potato-gall; polythalamous.
<b>scitula</b>	Bass. '64, p. 683 (Cynips)	♂ ♀	<i>Q. rubra</i> , <i>Q. tinctoria</i> . Mass., Conn., Iowa, Mich. Spring. Branch becomes ovoid gall.
<b>seminator</b>	Harr. '41, p. 399 (Cynips)	♂ ♀	<i>Q. alba</i> , <i>Q. prinus</i> , <i>Q. bicolor</i> , Mass., R. I., N. Y., Ind., Mich., Fla., D. C. Spring. Late June. Cells on twigs and wool.
<b>seminosus</b>	Bass. '90, p. 76	♀	<i>Q. castanea</i> (?). Ohio. Cellulose; Potato-gall of twig.
<b>similis</b>	Bass. '64, p. 685 (Cynips)	♂ ♀	<i>Q. ilicifolia</i> , <i>Q. stellata</i> , <i>Q. nana</i> , S. N. E., N. Y., N. J. Over winters. Early summer. Monothalamous club.
<b>suttonii</b>	Bass. '81, p. 54 (Cynips)	♀	<i>Quercus</i> sp., Cal. Potato-gall with concealed tubes.



<b>saccularius</b>	Bass. '90, p. 76	♂	<i>Q. coccinea</i> , Conn. Conical, thin-walled, free kernel.
<b>tuberosa</b>	Bass., '00, p. 311	♂ ♀	<i>Q. ilicifolia</i> , <i>Q. nana</i> , <i>Q. imbricaria</i> , Ohio, Mass., Conn. Branch = ovoid gall.
<b>tumifica</b>	O. S. '65, p. 356 (Cynips)	♂ ♀	<i>Q. alba</i> , <i>Q. tinctoria</i> , <i>Q. rubra</i> , Mass., N. Y., Ind. Spring. Late June. Swollen mid-vein.
<b>vaccinifoliæ</b>	Ash. '97, p. 130	♀	<i>Q. vaccinifolia</i> (?) Cal. Late fall. Large, filamentous oak-apple.

## s. g. ANDRICUS

<b>apicalis</b>	Ash. '97, p. 120	♀	<i>Q. wisliceni</i> , Cal. Root-gall.
<b>ashmeadii</b>	Bass. '00, p. 320-321	♀	( <i>Q. bicolor</i> ) Apr. 23. Gall unknown.
<b>aztecus</b>	Cameron '97, p. 261	♀	(Mexico).
<b>batatoides</b>	Ash. '81, p. X. (O. S. '62, p. 259) (Cynips)	♀	<i>Q. virens</i> , Fla., D. C. Potato gall of twigs.
<b>blastophagus</b>	Ash. '87, p. 143	♀	<i>Q. cinerea</i> , Fla. Spring. May. Cells oval, crowded on swollen aments. Cell in bud.
<b>calycicola</b>	Ash. '87, p. 141	♀ (?)	<i>Q. laurifolia</i> , Fla. Winters. Feb.
<b>capsualus</b>	Ash. '85, p. IX (Cynips)	♀	<i>Q. catesbæi</i> , <i>Q. cinerea</i> , Fla. Apr. Next spring. Ovate, chambered bullet-gall.
<b>capsula</b>	Bass. '81, p. 101 (Cynips)	♂ ♀	<i>Q. bicolor</i> , Conn. June. Pedicelled gall on leaf
<b>californicus</b>	Bass. '81, p. 51 (Cynips)	♀	<i>Quercus</i> species, Cal. Oct. Sub-globular, polythalamous bullet-gall.
<b>cellularius</b>	Gill. '92, p. 247	♀	<i>Q. undulata</i> , Colo. Late May. Cells in buds.
<b>chinquapin</b>	Fitch 5 Rept., p. 820 (Figites)	♀	<i>Q. prinoides</i> , N. Y. May. Pedicelled gall on leaf.
<b>chrysolepidis</b>	Ash. '97, p. 119	♀	<i>Q. chrysolepis</i> , Cal. Jan. Bullet-gall (?).
<b>cicatriculus</b>	Bass. '81, p. 101, '90, p. 80 (Cynips)	♂ ♀	<i>Q. alba</i> , <i>Q. prinus</i> , <i>Q. prinoides</i> , Conn., Mass., R. I. Spring. Late June. Sudden gall on mid-vein.
<b>cinerosus</b>	Bass. '81, p. 110 (Cynips)	♀	<i>Quercus</i> , Tex. 3-4 in. bullet-gall.
<b>cinnamomeus</b>	Ash. '87b, p. 137	♀	<i>Q. parvifolia</i> , Fla. Apr. (transformed). Cell in buds.
<b>clavigerus</b>	Ash. '81, p. XXVI (Cynips)	♀	<i>Q. laurifolia</i> , Fla. Early May. Potato-gall with honey-secreting tube.
<b>congregatus</b>	Ash. '97, p. 120	♀	<i>Q. chrysolepis</i> , <i>Q. agrifolia</i> , Cal. Pedunculate on twigs.
<b>coniferus</b>	Ash. '81, p. XXVII (Cynips)	♀	<i>Q. phellos</i> , <i>Q. laurifolia</i> , Fla. Sessile. cone-shaped oak bullet.
<b>coxii</b>	Bass. '81, p. 112 (Cynips)	♀	<i>Quercus</i> species, Ariz. May 9-19. Swelling of twig.
<b>cryptus</b>	Ash. '87b, p. 145, '00, p. 320	♀	<i>Q. catesbæi</i> , Fla. May. Cells under bark of twigs.

<i>crystallinus</i>	Bass. '00, p. 319	♀	<i>Q. agrifolia</i> (?), Cal. Globular; of crystalline texture.
<i>difficilis</i>	Ash. '87, p. 143	♀	<i>Q. cinerea</i> , Fla. Aug., Sept. 1-10 in. clustered bullet-gall. (Very scaly.)
<i>dasydactyli</i>	Ash. '97, p. 117	♀	<i>Q. chrysolepis</i> , Cal. Jan. Large cell on twig covered with wool.
<i>exiguus</i>	Bass. '00, p. 333, 318, 319 ( <i>Neuroterus</i> )	♂ ♀	<i>Q. obtusiloba</i> , Conn. Spring. Cells among florets of aments.
<i>excavatus</i>	Ash. '97, p. 121	♀	<i>Q. rubra</i> , N. E., N. C. Winters. June. 5-6 mm. Bullet-gall in fissures.
<i>femoratus</i>	Ash. '87, p. 141	♀	<i>Q. tinctoria</i> , <i>Q. rubra</i> , Fla., Ind. Globular, small, fibrous oak-apple.
<i>floci</i>	Walsh '64, p. 482 ( <i>Cynips</i> )	♀	White oaks, Ill., Iowa, Mich., D. C., N. Y., Mass. Winters. Spring. Cells covered by wool; on leaf.
<i>floridanus</i>	Ash. '87b, p. 137	♂ ♀	<i>Q. parvifolia</i> , Fla. Polythalamous twig club.
<i>foliaformis</i>	Gill. '89, p. 214	♀	<i>Q. alba</i> , Mich. Early summer (?). Late May. Fleshy, flower-shaped gall on leaf.
<i>foliatus</i>	Ash. '81, p. XII ( <i>Cynips</i> )	♀	<i>Q. virens</i> , Fla. Cell in bud and rosette of leaves.
<i>formosus</i>	Bass. '64, p. 679 ( <i>Cynips</i> )	♀	<i>Q. rubra</i> , Conn. Winters. Spring. Ovate, chambered bullet-gall.
<i>frequens</i>	Gill. '92, p. 247	♀	<i>Q. undulata</i> , Colo. May 10. Potato-gall.
<i>fusiformis</i>	O. S. '61, p. 61 ( <i>Cynips</i> )	♀	<i>Q. alba</i> , Md., D. C., Canada. May. Pedicelled on leaf.
<i>gemmarius</i>	Ash. '85, p. VIII ( <i>Cynips</i> )	♀	<i>Q. cinerea</i> , Fla. Spring. Spring of next year. Small galls clustered on twig.
<i>gibbosus</i>	Prov. '81, p. 232-233	♂ ♀	(Quebec)
<i>howertoni</i>	Bass. '90, p. 82	♀	<i>Quercus</i> species, N. Mex. Mono-thalamous club-gall.
<i>ignotus</i>	Bass. '00, p. 317-318	♀	(New species) Conn.
<i>imbricariæ</i>	Ash. '97, p. 122	♀	<i>Q. ilicifolia</i> , <i>Q. imbricaria</i> , Mo. Sept., Oct. Small bullet-gall; hard cluster.
<i>incertus</i>	Bass. '00, p. 317	♀	( <i>Q. bicolor</i> , Apr. 28) (Gall unknown).
<i>infuscatus</i>	Ash. '87, p. 144	♀	<i>Q. catesbæi</i> , Fla. Winters. March. Cells on leaf under wool.
<i>indistinctus</i>	Bass. '90, p. 81	♀	<i>Q. alba</i> , Ohio. Small, thin-walled bullet-gall.
<i>kingi</i>	Bass., '00, p. 316	♀	<i>Q. alba</i> (?), Cal. Conical on leaf. Hollow with cell within.
<i>lanigerus</i>	Ash. '81, p. XIII ( <i>Cynips</i> )	♀	<i>Q. virens</i> , Fla. 2-6 cells on leaf under wool.
<i>maxwelli</i>	Bass. '90, p. 83	♂ ♀	<i>Quercus</i> species, Tex. Apr. Polythalamous gall; woody bullet-gall (?).
<i>medullæ</i>	Ash. '85, p. VIII ( <i>Cynips</i> )	♀	<i>Q. cinerea</i> , Fla. Gradual enlargement of twig.

(?) <i>mexicanus</i>	Bass. '90, p. 78		<i>Quercus</i> species, Méx. Polythalamous gall under wool on leaf.
<i>morrisoni</i>	Ash. '97, p. 116	♂ ♀	<i>Quercus</i> , Ariz. Late June. Polythalamous, abrupt gall at base of leaf-blade.
<i>murtfeldtæ</i>	Ash. '97, p. 117	♀	<i>Quercus</i> species, Mo. (?) Irregular, polythalamous bullet-gall.
<i>obtusilobæ</i>	Bass. '00, p. 316	♀	(New species) (Conn.).
<i>osten-sackenii</i>	Bass. '63, p. 327 (Cynips)	♂ ♀	<i>Q. ilicifolia</i> , <i>Q. coccinea</i> , Conn., Mass., D. C., Mo. Early summer. Late June. Small filamentous oak-apple.
<i>pacificus</i>	Ash. '97, p. 118	♀	<i>Q. chrysolepis</i> , Cal. Small bullet-gall.
<i>parmula</i>	Bass. '00, p. 312	♀	<i>Quercus</i> species, Cal. Saucer-shaped galls beneath leaf.
<i>patiens</i>	Bass. '00, p. 312-313	♀	( <i>Q. ilicifolia</i> , spring).
<i>pattoni</i>	Bass. '81, p. 98 (Cynips)	♀	<i>Q. obtusiloba</i> , Conn. Winters. Feb. Cells on leaf under wool.
<i>perditor</i>	Bass. '00, p. 313	♀	<i>Q. ilicifolia</i> , Conn., Mass. Acorn becomes a gall.
<i>perplexus</i>	Ash. '97, p. 122	♀	<i>Quercus</i> species, Mo. Nov. 5 mm. Ovoid bullet-gall.
<i>petiolicola</i>	Bass. '63, p. 324 (Cynips)	♂ ♀	Various oaks, Mass., Conn., N. Y., Ind., Ill., Mich., Iowa, D. C. Late June. Sudden gall on leaf rib.
<i>piger</i>	Bass., '81, p. 105 (Cynips)	♀	<i>Q. tinctoria</i> , <i>Q. velutina</i> , <i>Q. rubra</i> . Mass., Conn., N. Y. July. Late Sept. Swelling of mid-vein.
<i>pomiformis</i>	Bass. '81, p. 74 (Cynips)	♀	<i>Q. agrifolia</i> , Cal. Mar. 1. Polythalamous, globular, bullet-gall on twigs.
<i>piperoides</i>	Bass. '00, p. 314	♀	<i>Q. rubra</i> , Conn., Mass. Summer and fall. Second spring after. Woolly globular galls of leaf; tear mid-rib.
<i>pruinosis</i>	Bass. '00, p. 311	♀	<i>Q. obtusiloba</i> , Conn. Small, globular, thin-walled gall of leaf on aments.
<i>pulchellus</i>	Bass. '00, p. 314	♀	( <i>Q. prinoides</i> , Conn.).
<i>quercifoliæ</i>	Ash. '85b, p. 299	♂ =	<i>Dryophanta</i> (Ash. '87).
<i>quinqueseptum</i>	Ash. '85b, p. 299	♂	<i>Q. obtusiloba</i> , Fla. July. Rounded, abrupt, partitioned; on mid-vein.
<i>rileyi</i>	Ash. '97, p. 121	♀	<i>Q. rubra</i> , Mo. Early July. 3 mm. Thin-walled gall below leaf.
<i>rugosus</i>	Ash. '81, p. XVIII (Cynips)	♂ ♀	<i>Q. laurifolia</i> , Fla. Late Apr. Hard, hemispherical gall on leaf.
<i>saltatus</i>	Ash. '87, p. 142	♀ =	<i>Trisolenia</i> .
<i>singularis</i>	Bass. '63, p. 326 (Cynips)	♂ ♀	<i>Q. rubra</i> , <i>Q. coccinea</i> , Mass., N. Y., D. C., Conn., Mich. Early summer. Late June. Small, filamentous, oak-apple.
<i>speciosus</i>	Bass. '90, p. 81	♀	<i>Quercus</i> species, Cal. Globular, of crystalline texture on leaf.

<i>spongiola</i>	Gill. '94, p. 235	♀	<i>Q. garryana</i> , Wash. Nov. Clustered, polythalamous bullet-galls on twigs.
<i>stropus</i>	Ash. '87b, p. 136	♀	<i>Q. obtusiloba</i> , Fla. March. Cell in bud and rosette of leaves.
<i>topiarius</i>	Ash. '87b, p. 136	♀	<i>Q. obtusiloba</i> , Fla. March. 3-5 cells in bud and a rosette of leaves.
<i>tubicola</i>	O. S. '61, p. 60 (Cynips)	♀	<i>Q. obtusiloba</i> , D. C. Oct. Crystal-line, erect tubes on leaf surface.
<i>turneri</i>	Ash. '81, p. XVI (Cynips)	♀	<i>Q. aquatica</i> , Fla. Spring. Apr. 28. Cells on aments.
<i>utriculus</i>	Bass. '81, p. 78 (Cynips)	♂ ♀	<i>Q. alba</i> , Mass., Conn. June. Globular, thin-walled gall on margin of leaf.
<i>ventricosus</i>	Bass. '64, p. 681 (Cynips)	♀	<i>Q. tinctoria</i> , <i>Q. nigra</i> , <i>Q. ilicifolia</i> . Conn., Mass., R. I. Late May. Spring. Conical, hard gall with cell on twigs.
<i>virens</i>	Ash. '81, p. IX (Cynips)	♀	<i>Q. virens</i> , Fla. Feb. Solid gall with central kernel; on leaf.
<i>wisliceni</i>	Ash. '97, p. 119	♀	<i>Q. wisliceni</i> , Cal. Oct. Small bullet-gall.

## AMPHIBOLIPS

<i>acuminata</i>	Ash. '97, p. 126	♀	<i>Q. nigra</i> , Md., D. C. Late June. Large, oval, spongy oak-apple.
<i>badius</i>	Bass. '00, p. 323	♀	(White oak) (Gall unknown).
<i>caroliniensis</i>	Bass. '90, p. 85	♀	<i>Q. obtusiloba</i> (?), N. C. Globular, thin-walled, spongy oak-apple.
<i>cinerea</i>	Ash. '81, p. XIX (Cynips)	♀	<i>Q. cinerea</i> , Fla. Filamentous oak-apple on twigs.
<i>citriformis</i>	Ash. '81, p. XXVIII (Cynips)	♀	<i>Q. phellos</i> , Fla. Early May. Ovoid, filamentous oak-apple.
<i>coelebs</i>	O. S. '61, p. 60 (Cynips)	♂	<i>Q. rubra</i> , D. C., N. Y. June. Mid-June. Pedicelled gall on leaf.
<i>confluentus</i>	Harr. '41, p. 397, p. 253-254 pl. 8, fig. 9, 10	♂ ♀	Red and Black oaks, Can., Mass., R. I., Ind., Ill., D. C., Conn., N. Y. (a) Spring, June, ♂ ♀, (b) spring, Oct., ♀. Large, spongy oak-apple.
<i>cookii</i>	Gill. '89, p. 220, fig. 6	♀	<i>Q. rubra</i> , Mich. Ovoid, fibrous oak-apple in buds.
<i>fuliginosa</i>	Ash. '85, p. VII (Cynips)	♀	<i>Q. laurifolia</i> , Fla. 3-10 in. bullet-gall (?) leaf on twig.
<i>gainesi</i>	Bass. '00, p. 322	♀	<i>Q. tinctoria</i> (?), Tex. Fleshy gall on cupule.
<i>ilicifoliae</i>	Bass. '64, p. 681 (Cynips)	♂ ♀	<i>Q. ilicifolia</i> , <i>Q. nana</i> , <i>Q. pumila</i> , Mass. R. I., Conn., N. Y., N. J. Early summer. July. Ovoid, filamentous oak-apple.
<i>inanis</i>	O. S. '61, p. 58, '62, p. 242 (Cynips)	♂ ♀	Various oaks especially red groups. N. E., N. Y., Ind., Ill., Iowa, D. C. Early summer. Late June. Large filamentous oak-apple.

<b>longicornis</b>	Bass. '00, p. 321	♂	Quercus species, Tex. Large, ovoid, spongy oak-apple.
<b>melanocera</b>	Ash. '85b, p. 299	♀	Q. aquatica, Fla. June. Ovoid, filamentous oak-apple on twigs.
<b>nubilipennis</b>	Harr. '41, p. 398 (Cynips)	♂ ♀	Q. rubra, Mass., N. Y., Ill., Mich. June. Late June. Succulent, solid; on leaf.
<b>palmeri</b>	Bass. '90, p. 86	♀	Quercus species, Mex. Large, spongy oak-apple.
<b>prunus</b>	Walsh '64, p. 104 (Cynips)	♀	Q. rubra, Q. tinctoria, Q. nigra, Mass. R. I., N. Y., Ill., Mich., Iowa. Aug., Sept. April often of second year. Fleshy gall on cupule.
<b>racemaria</b>	Ash. '81, p. XXVI (Cynips)	♀	Q. laurifolia, Fla. Forms early May. Mid-May. Small, succulent, solid; on leaf.
<b>sculpta</b>	Bass. '63, p. 324 (Cynips)	♂ ♀	Q. rubra, Q. coccinea, Mass., Iowa, Ill., Conn., Mich., Ind. June. Late June. Succulent, solid; on leaf. A. nubilipennis Harr.
<b>spinosa</b>	Ash. '87, p. 141	♀	Q. laurifolia, Fla. Jan. Small, globular, prickly, spongy oak-apple.
<b>tinctoriæ</b>	Ash. '97, p. 125	♀	Q. tinctoria, Oct. Fibrous, compressed, ovate oak-apple.
<b>trizonata</b>	Ash. '97, p. 125	♂ ♀	Quercus species, Ariz. June. Globular, spongy oak-apple (?) on aments.
<b>verna</b>	Bass. '00, p. 321	♀	(Q. ilicifolia, Apr.) Conn. (Gall unknown).

## ACRASPIS

<b>bicolor</b>	Gill. '91, p. 197	♀	Oak.
<b>compressum</b>	Gill. '91, p. 197	♀	Q. rubra, Iowa. Winters. Wax-like; 3 mm., globular; on leaf. Philonix
<b>echini</b>	Ash. '87, p. 140	♀	Q. bicolor, Fla. Nov. Spine-tipped facets; globular; on leaf; 2-celled. Philonix
<b>erinacei</b>	Walsh '64, p. 483 (Cynips)	♀	(no description) Q. alba, Q. rubra, Colo., N. Y., Mich., Ind., Ill. Globular, spinose; on leaves. Philonix
<b>fulvicollis</b>	Fitch 5 Rept., p. 783 (Philonyx)	♀	(N. Y.) (Gall unknown). (See Bass., Ash.) Philonix
<b>gillettei</b>	Bass. '00, p. 323	♀	Q. alba, Conn., Mich. Solid gall on leaf; kernel in centre. Philonix niger Gill



<i>lanæglobuli</i>	Ash. '87, p. 139	♀	<i>Q. bicolor</i> , Fla. Solid gall on leaf with kernel in centre. Philonix
<i>macrocarpæ</i>	Bass. '90, p. 84	♀	<i>Q. macrocarpa</i> , N. Y., Mich., Ohio, Iowa. Autumn. Facetted, hard, globular; on leaf. Philonix
<i>niger</i>	Gill. '90, p. 23	♀	<i>Q. alba</i> , Mich., Iowa. Late Sept. On leaf; nearly a fibrous oak-apple, but denser in texture. Philonix
<i>nigricollis</i>	Fitch 5 Rept., p. 783 (Philonix)	♀	(N. Y.) (Gall unknown).
<i>pezomachoides</i>	O. S. '62, p. 250 (Cynips)	♀	<i>Q. alba</i> , <i>Q. bicolor</i> , Mass., N. Y., D. C., Ind., Mo. June, Sept. Facetted, globular, bicameral; on leaf. Philonix
<i>politus</i>	Bass. '90, p. 85	(?) ♀	(Missouri) (Gall unknown). Philonix
<i>undulata</i>	Gill. '93, p. 28	♀	<i>Q. undulata</i> , Colo. Facetted, globular; on leaf. Philonix <i>macrocarpæ</i> Bass.
<i>vaccinii</i>	Ash. '87, p. 136	♀	= <i>Zophoterias</i> , <i>Q. obtusiloba</i> , Fla. Clustered, urn-shaped; on leaf.
<i>villosus</i>	Gill. '89, p. 218, 221	♀	<i>Q. macrocarpa</i> , Mich., Iowa. Summer (?). Late Oct. Globular, long, slender spines on leaf. Philonix

**BASSETTIA** (Ash. '87)

<i>floridana</i>	Ash. '87, p. 146	♀	
<i>gemmæ</i>	Ash. '97, p. 128	♀	(Apr., Mo.) (Gall unknown).
<i>pallida</i>	Ash. '97, p. 128	♀	(Apr., Georgia) (Gall unknown).
<i>tenuicornis</i>	Bass. '81, p. 92 (Cynips) (Ash. '87, p. 147)	♀	<i>Quercus</i> species, Ariz. Fall. Cells under woof on leaf bonded together by a brittle substance.

**BELENOCNEMA** (Mayr '81)

<i>colorado</i>	Gill. '93, p. 210	♀	(Colo., June) (Gall unknown).
<i>treatæ</i>	Mayr '81, p. 17	♂ ♀	Fla. Root-gall.

**BIORHIZA**

<i>forticornis</i>	Walsh '64, p. 489 (Cynips)	♀	= <i>Xanthoterias</i> (Ash. '97b). Biorhiza
<i>hirta</i>	Bass. '64, p. 687 (Cynips)	♀	<i>Q. montana</i> , <i>Q. monticola</i> , <i>Q. prinus</i> , Conn., N. Y., Md. Nov. Facetted, globular; on leaf.
<i>mellea</i>	Ash '89, p. 138	♀	= <i>Sphæroterias</i> (Ash. '97b). Biorhiza
<i>nigra</i>	Fitch 5 Rept., p. 782	♀	(N. Y.) (Gall unknown).
<i>rubinus</i>	Gill. '89, p. 215, 221	♀	= <i>Phylloterias</i> (Ash. '97b).

**COMPSODRYOXENUS** (Ash. '97)

<b>brunneus</b>	Ash. '97, p. 129	♀	<i>Quercus</i> , Cal. Oval bullet-gall (?).
<b>maculipennis</b>	Ash. '97, p. 129	♀	<i>Q. virens</i> , Ariz. May 9-19. Potato-gall on twig.

**CALLASPIDIA**

<b>globulus</b>	Fitch 5 Rept., p. 810	♀ = <i>Holcaspis</i> .
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**DOLICHOSTROPUS**

<b>majalis</b>	Bass. '64, p. 682 ( <i>Cynips</i> )	♂ ♀	<i>Q. alba</i> , <i>Q. prinus</i> , <i>Q. bicolor</i> , Conn., Fla. Spring (?). June. Platform in leaf-blade. (See <i>Neuroterus</i> .)
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**DRYORHIZOXENUS** (Ash. '81)

<b>floridanus</b>	Ash. '81, p. XXV	♂ ♀ = <i>Belenocnema treatæ</i>
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**DRYOPHANTA**

<b>aquaticæ</b>	Ash. '81, p. XVI ( <i>Cynips</i> )	♂ ♀	<i>Q. aquatica</i> , Fla. Mar. 3-10 in., globular; hollow, free cell.
<b>bella</b>	Bass. '81, p. 93 ( <i>Cynips</i> )	♀	<i>Quercus</i> , Ariz. Small, filamentous oak-apple.
<b>carolina</b>	Ash. '87b, p. 145	♀	<i>Q. alba</i> , N. C. Feb. Small gall on petiole.
<b>confusa</b>	Ash. '81, p. XVIII ( <i>Cynips</i> )	♀	<i>Q. laurifolia</i> , Fla. Late April. Globular, small, free kernel.
<b>corrugis</b>	Bass. '90, p. 71-72	♀	(Aments <i>Q. prinoides</i> , Conn.) (Gall unknown).
<b>discus</b>	Bass. '00, p. 326	♀	<i>Quercus</i> species, Cal. Disc-like beneath leaf.
<b>eburneus</b>	Bass. '90, p. 70-71	♀	<i>Quercus</i> species, Utah. Globular, on leaf; filamentous oak-apple.
<b>emoryi</b>	Ash. '97, p. 115	♀	<i>Q. emoryi</i> , N. Mex. Dec. On leaf; small, filamentous oak-apple.
<b>gemula</b>	Bass. '81, p. 104 ( <i>Cynips</i> )	♂ ♀	<i>Q. prinoides</i> , Conn., Mass. Late May. Ovoid cell in buds.
<b>glabra</b>	Gill. '94, p. 237	♀	<i>Q. undulata</i> , <i>Q. gambeli</i> , Colo. Small filamentous oak-apple on leaf. <i>D. eburnea</i> Bass.
<b>ignota</b>	Bass. '81, p. 106 ( <i>Cynips</i> )	♀	<i>Q. bicolor</i> , Conn., Mass. Cells prostrate on leaf under wool.
<b>lanata</b>	Gill. '91, p. 198, pl. 9, fig. 5	♀	<i>Q. rubra</i> , <i>Q. coccinea</i> , <i>Q. ilicifolia</i> . Mass., Iowa, Ill. Winters. Summer. Cells large, conical under wool on leaf.
<b>laurifoliæ</b>	Ash. '81, p. XVII ( <i>Spa-thegaster</i> )	♂ ♀	<i>Q. laurifolia</i> , Fla. March. Globular, hollow, free kernel.
<b>liberæcellulæ</b>	Gill. '90, p. 24, fig. 1	♂ ♀	<i>Q. rubra</i> , <i>Q. coccinea</i> , Mich., Iowa. Late May. Round, hollow, free kernel.

<i>longicornis</i>	Bass. '00, p. 327	♂ ♀	<i>Q. obtusiloba</i> , Conn. Gall (?).
<i>notha</i>	O. S. '70, p. 55-56 (Cynips)	♂ ♀ = ?	<i>Cal. palustris</i> (Globular, hollow free kernel).
<i>nubila</i>	Bass. '81, p. 56 (Cynips)	♀	<i>Quercus</i> species, Ariz. On leaf; wool long; cells large, clustered.
<i>palustris</i>	O. S. '61, p. 62 (Cynips)	♂ ♀ =	<i>Callirhytis</i> . (See <i>Callirhytis palustris</i> .)
<i>pallipes</i>	Bass. '00, p. 327		<i>Q. prinoides</i> Conn. Spring. Cell in bud with few threads around it.
<i>papula</i>	Bass. '81, p. 107 (Cynips)	♀	<i>Q. rubra</i> , <i>Q. tinctoria</i> , <i>Q. coccinea</i> . Mass., Conn., Mich. July. Conical platform in leaf-blade.
<i>parvula</i>	Bass. '00, p. 326	♀	( <i>Q. ilicifolia</i> May. Conn.). (Gall unknown.)
<i>pedunculata</i>	Bass. '90, p. 72	♂ ♀	<i>Q. rubra</i> , <i>Q. coccinea</i> . Conn. Pedicelled gall on leaf.
<i>polita</i>	Bass. '81, p. 99 (Cynips)	♀	<i>Q. obtusiloba</i> , <i>Q. minor</i> . N. Y., Pa., Md., N. J. Spring. Clustered, filamentous oak-apples on leaves.
<i>porterae</i>	Cockerell '00, p. 91	♀	<i>Q. undulata</i> . N. Mex. Late Jan. Spherical, clustered, thin-walled; on leaf.
			<i>D. pulchripennis</i> Ashm.
<i>pumiliventris</i>	Bass. '90, p. 69	♂	( <i>Quercus</i> species) Ovoid, polythalamous bullet-gall.
<i>pulchripennis</i>	Ash. '97, p. 115	♀	<i>Quercus</i> species. Ariz. Apr. Hemispherical; on leaf.
<i>quercifoliae</i>	Ash. '85b, p. 299 (Andricus)	♂	<i>Q. catesbaei</i> . Fla. Spring (?). May. Hollow, free cell.
<i>radicola</i>	Ash. '97, p. 116	♀	<i>Q. alba</i> and (?). Mo., Ind. Late May. (?)
<i>rydbergiana</i>	Cockerell '03, p. 217	♀	<i>Q. rydbergiana</i> , N. Mex. Small, spongy, oak-apple.
<i>similis</i>	Bass. '90, p. 71	♀	<i>Quercus</i> species. Utah. Globular; on leaf; filamentous oak-apple.
			<i>D. simillina</i> D. T.
<i>texana</i>	Ash. '87, p. 145	♀	(Texas). - (Gall unknown.)
<i>vesiculoides</i>	Ash. '97, p. 114	♂ ♀	<i>Q. obtusiloba</i> , Mo. May. Bladder in buds.
			<i>D. clarkei</i> Bass.
<i>clarkei</i>	Bass. '90, p. 69	♂ ♀	<i>Q. alba</i> , Mass. Early spring. Capsules fill leaf-bud.
<i>cinerea</i>	Ash. '87, p. 144	♀	<i>Q. cinerea</i> , Fla. May. Conical, hollow, free kernel.

## EUMAYRIA

<i>floridana</i>	Ash. '87, p. 147	♀	(Fla. March). (Gall unknown.)
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## FIGITES

<i>chinquapin</i>	Fitch 5 Rept., p. 820	♀ =	Andricus.
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## HOLCASPIS

<b>arizonica</b>	Cockerell '02, p. 183	♀	<i>Q. arizonica</i> , Ariz. Late Apr. Globular gall on petiole; at least 2 cells.
<b>bassetti</b>	Gill. '89, p. 215, 217, fig. 20, 22	♀	<i>Q. bicolor</i> , Mich. Attenuated cone clustered on twig.
<b>brevipennata</b>	Gill. '93, p. 131	♀	<i>Q. undulata</i> , Colo. Small, filamentous oak-apple.
<b>canescens</b>	Bass. '90, p. 66	♀	<i>Quercus</i> , Cal. Small, ovoid bullet-gall.
<b>centricola</b>	O. S. '61, p. 58 (Cynips)	♀	<i>Q. obtusiloba</i> , D. C., Ind. Autumn. Filamentous oak-apple on leaves.
<b>colorado</b>	Gill. '93, p. 210	♀	Colo. Rugose bullet-gall.
<b>corallinus</b>	Bass. '90, p. 66	♀	Cal. Spiny bullet-gall.
<b>corrugis</b>	Bass. '81, p. 109-110 (Cynips)	♀	( <i>Q. prinoides</i> Conn.) (Gall unknown.)
<b>douglasii</b>	Ash. '97, p. 127	♀	<i>Q. douglasii</i> , Cal. Dec. Squash-shaped bullet-gall.
<b>duricoria</b>	Bass. '90, p. 64	♀	Various oaks, Mass., R. I., N. Y., Conn., Ohio., Mich., Ill. Oct. Ovoid bullet-gall. <i>H. mamma</i> Walsh
<b>fasciata</b>	Bass. '00, p. 328	♀	<i>Q. ilicifolia</i> , <i>Q. rubra</i> , Mass., R. I., Conn. Belted with purple; bullet-gall.
<b>ficigera</b>	Ash. '85, p. VI (Cynips)	♀	<i>Q. virens</i> , Fla. Clustered galls like pressed figs in form.
<b>ficula</b>	Bass. '81, p. 75 (Cynips)	♀	<i>Q. macrocarpa</i> , Fla., Ga. Clustered galls making a cedar cone structure. <i>H. spongiosa</i> Karsch
<b>globulus</b>	Fitch 5 Rept., p. 810 (Calaspidia)	♀	Various oaks, S. N. E., Ind. D. C., Ill., Mo., Mich. Globular bullet.
<b>maculipennis</b>	Gill. '94, p. 236	♀	<i>Q. wrightii</i> , N. Mex. Small, filamentous oak-apple.
<b>monticola</b>	Gill. '93, p. 30	♀	<i>Quercus</i> , Colo. Nov. 1-4 in. Cylindric; in twig (socket). <i>H. perniciosus</i> Bass
<b>persimilis</b>	Ash. '97, p. 126	♀	<i>Q. nigra</i> , Nov. 7 mm. Rugose bullet.
<b>perniciosus</b>	Bass. '90, p. 68	♀	<i>Quercus</i> , Utah. Small, ovoid bullet.
<b>rugosa</b>	Bass. '81, p. 100 (Cynips)	♀	<i>Q. bicolor</i> , <i>Q. prinus</i> , <i>Q. ilicifolia</i> , Mass., Conn., Fla., Mich. Late summer. Oct. Rugose bullet-gall. <i>H. globulus</i> Fitch
<b>rubens</b>	Gill. '93, p. 29	♀	Colo. Oct. Oak-bullet.
<b>omnivora</b>	Ash. '85, p. VI (Cynips)	♀	<i>Q. virens</i> , <i>Q. cinerea</i> , <i>Q. catesbaei</i> , Fla. Oak-bullet.
<b>sileri</b>	Bass. '90, p. 67	♀	<i>Quercus</i> , Utah. Ovoid bullet.
<b>succinipes</b>	Ash. '81, p. XI (Cynips)	♀	<i>Q. virens</i> , Fla. 1-10 in. Clustered; bullet-gall.
<b>truckensis</b>	Ash. '97, p. 127	♀	<i>Q. vaccinifolia</i> , Cal. Polythalamous bullet-gall in slit of twig.

**LOXAULUS** (Mayr '81)

<i>mammula</i>	Bass. '81, p. 76 (Cynips)	♂ ♀	<i>Q. alba</i> , Conn., Mass. July. Cells under bark; swelling at base of shoots.
<i>spicata</i>	Bass. '00, p. 329	♀	<i>Q. virens</i> , Ariz. Clustered galls like an ear of corn.

**NEUROTERUS**

<i>affinis</i>	Bass. '81, p. 103 (Cynips)	♂ ♀	<i>Q. prinoides</i> , Conn. Capsule in bud. <i>N. vesiculus</i> Bass.
<i>batatus</i>	Fitch 5 Rept., p. 810 (Cynips)	♂ ♀	<i>Q. alba</i> , <i>Q. bicolor</i> , <i>Q. palustris</i> , D. C., Mass., Conn., N. Y. (a) gall winters. May ♂ ♀; (b) spring, June ♀. Polythalamous twig-club.
<i>catesbæi</i>	Ash. '81, p. XV (Cynips)	♂ ♀	<i>Q. catesbæi</i> , Fla. Late Apr. Swellings at base of new shoots.
<i>congregatus</i>	Gill. '93, p. 166	♂	<i>Quercus</i> , Colo. Mid-May. Leaf-bud becomes a mass of pubescent capsules.
<i>consimilis</i>	Bass. '00, p. 335	♂ ♀	<i>Q. alba</i> , Conn. Mid-summer. Polythalamous twig-club.
<i>crassitelus</i>	Provancher '81, vol. 12, p. 233	♀	(Quebec). (Gall unknown.)
<i>distortus</i>	Bass. '00, p. 336	♂ ♀	<i>Q. bicolor</i> , Conn. Cells in wood; dwarfs twigs.
<i>dubia</i>	Bass. '00, p. 335	♂ ♀	<i>Q. alba</i> , Mass., R. I., Conn. Winters. Each cell capped with wool in rows along veins. <i>N. floccosus</i> Bass.
<i>exiguissimus</i>	Bass. '00, p. 332	♀	
<i>exiguus</i>	Bass. '00, p. 333	♂ ♀	<i>Q. obtusiloba</i> , Conn. Cells in aments.
<i>favosus</i>	Bass. '90, p. 87	♂ ♀	<i>Q. tinctoria</i> , <i>Q. palustris</i> , <i>Q. rubra</i> . Mass., Ohio. Irregular platform in leaf-blade.
<i>flavipes</i>	Gill. '90, p. 21	♂ ♀	<i>Q. macrocarpa</i> , Iowa. Early July. Hard swelling of mid-vein.
<i>floccosus</i>	Bass. '81, p. 111 (Cynips)	♀	<i>Q. bicolor</i> , Conn., Mass. Winters. Spring. Blisters above, woolly galls below.
<i>fragilis</i>	Bass. '00, p. 335	♂ ♀	<i>Q. virens</i> (?), Cal. Platform in lamina.
<i>gillettei</i>	Bass. '00, p. 334	♂ ♀	<i>Q. obtusiloba</i> , Conn. Mid-vein; pustular swellings.
<i>howertoni</i>	Bass. '90, p. 90	♀	<i>Quercus</i> , N. Mex. Blisters in leaf-blade.
<i>irregularis</i>	O. S. '61, p. 65 (Cynips)	♂?	<i>Q. obtusiloba</i> , D. C. Spring. Late May. Platform in leaf-blade.
<i>laurifoliæ</i>	Ash. '87, p. 140	♀	<i>Q. imbricaria</i> , <i>Q. laurifolia</i> , Ohio, Fla., Ill. Disc cells on leaf under wool.
<i>longipennis</i>	Ash. '87b, p. 140	♀	<i>Q. laurifolia</i> , Fla. May. Swelling at base of young twig.
<i>majalis</i>	Bass. '64, p. 682 (Cynips)	♂ ♀ = <i>Dolichostropus</i>	(Ash. '87).

<b>minuta</b>	Bass. '81, p. 96 (Cynips)	♂ ♀	Q. alba, Conn. Galls in bud aborting the leaves.
<b>minutissimus</b>	Ash. '85, p. VII (Cynips)	♀	Q. virens, Fla. Spring. Cells on leaf under wool.
<b>nigrum</b>	Gill. '89, p. 218, 221, fig. 5	♀	Q. alba, Q. macrocarpa, Mass., Iowa, Mich. Winters. May. Blisters in leaf-blade.
<b>noxiosus</b>	Bass. '81, p. 108 (Cynips)	♂ ♀	Q. bicolor, Q. alba, Q. palustris, Q. platanoides, Conn., R. I., Mass., N. Y., Mich. (a) Winters, spring, ♂ ♀ twig-club; (b) spring, June ♀ leaf swollen.
<b>pallipes</b>	Bass. '90, p. 89	♂ ♀	Q. alba, Mass. Small thin-walled gall on leaf.
<b>pallidus</b>	Bass. '90, p. 88	♂ ♀	Q. bicolor, Conn. Small, globular gall in aments.
<b>perminimus</b>	Bass. '00, p. 332	♂ ♀	Q. alba, Ohio. June, July. Blisters in leaf-blade. N. nigrum Gill.
<b>politus</b>	Bass. '90, p. 89	♂	Q. undulata (?), Utah. Swelling of mid-vein. N. quercicola D. T.
<b>rileyi</b>	Bass. '81b, p. 149 (Cynips)	♀	Q. prinoides, Q. prinus, Q. castanea, Mass., Conn., Ind., Ohio, Mo. May, June. Blisters under bark giving a swollen twig.
<b>tectus</b>	Bass. '00, p. 331	♂ ♀	Q. prinoides, Conn. May, June. Leaf distorted or branch dwarfed.
<b>saltatorius</b>	Edwards '76 (Cynips)		Q. undulata, White oak, Mo. (?) Jumping gall on leaves.
<b>umbilicatus</b>	Bass. '00, p. 330	♀	Q. bicolor, Q. platanoides, N. Y., N. J., Mass. Discs with depressed centre on leaf.
<b>vernus</b>	Gill. '90, p. 22	♀	Q. macrocarpa, Iowa (a) May, (b) June. Ovoid galls in buds amid aborted leaves.
<b>verrucarum</b>	O. S. '61, p. 61 (Cynips)	♀ (?)	Q. obtusiloba, D. C. Late summer. Hairy galls beneath leaf.
<b>vesicula</b>	Bass. '81, p. 97 (Cynips)	♂ ♀	Q. alba, Q. bicolor, Q. macrocarpa, Mass., Conn., Mich. May. Capsule in buds.
<b>virgeus</b>	Gill. '93, p. 166	♀	Quercus species, Colo. Early May. Slight twig swelling.

**PARATERAS** (Ash. '97c)

<b>hubbardi</b>	Ash. '97c, p. 262	♀	(Mich.). (Gall unknown.)
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**PHYLLOTERAS** (Ash. '97b, Psyche, p. 67)

<b>rubinus</b>	Gill. '89, p. 215 (Biorhiza)	♀	Q. alba, Mich. Fall. Succulent, solid, spherical gall on leaf. Biorhiza
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**SPHAEROTERAS** (Ash. '87b, p. 67)

- mellea** Ash. '87, p. 138 (Biorhiza) ♀ *Q. parvifolia*, Fla. Feb. Small, solid, fleshy, clustered; on leaf.  
Biorhiza

**XANTHOTERAS** (Ash. '97c, p. 261-262)

- forticornis** Walsh '64, p. 489 (Cynips) ♀ *Q. alba*, Mass., R. I., Conn., N. Y., Canada, Mich., Ill., N. H., Va., Mo., D. C., Iowa. Appears July and winters. (Inflated cells making a fig-like mass on twig.)  
Biorhiza

**XYSTOTERAS** (Ash. '97c)

- volutellæ** Ash. '97b, p. 260 ♀ *Q. macrocarpa*, Kansas. Jan., Conical, hollow, free kernel.

**TRICHOTERAS** (Ash. '97b)

- coquilletti** Ash. '97b, p. 67 ♀ *Quercus* species, Cal. Late Nov. Small, clustered, filamentous oak-apple on leaf. (Resembles *polita*.)

**ZOPHOTERAS** (Ash. '97c)

- vaccinii** Ash. '87, p. 136 (Acraspis) ♀ *Q. obtusiloba*, Fla., D. C. Winters. Feb. Urn-shaped galls clustered under leaf.

**TRISOLENIA**

- punctata** Ash. '97, p. 129 ♀ (N. J.). (Gall unknown.)  
**saltata** Ash. '87, p. 142 (Andricus, ♀ *Q. coccinea*, Fla. Mar. Fall. Ovoid Trisolenia) gall on twigs.

**TRIGONASPIS** (Hartig)

- radicis** Ash. '97, p. 113 ♂ ♀ *Quercus* species. Utah. Root-gall.

**SPATHEGASTER**

- q. laurifoliæ** Ash. '81, p. XVII ♂ ♀ = *Dryophanta*.

**ANTISTROPHUS** (Walsh '70)

- bicolor** Gill. '91, p. 197 ♀ *Mulgedium acuminata* and *Lactuca canadensis*, N. E., N. Y., Ill., D. C. Cells only, no gall in pith.  
Aulacidea.
- minor** Gill. '91, p. 196 ♀ *Silphium laciniatum*, Ill. Cells only; no gall in pith.  
*Aulax gillettei* Kieff.
- rufus** Gill. '91, p. 195 ♂ ♀ = *Aulax* (Mayr '02).  
**silphii** Gill. '91, p. 192 ♂ ♀  
*Aulax leavenworthi* Bass.

## AULAX

<b>ambrosiæcola</b>	Ash. '97, p. 134	♂ ♀	Ambrosia species, Mo. (?) Aulacidea.
<b>bicolor</b>	Gill. '91, p. 200-202	♀	Aulacidea.
<b>cavicola</b>	Ash. '97, p. 134	♀	(Mo., Apr. 30). (Gall unknown.) Aulacidea.
<b>(?) futilis</b>	O. S. '61, p. 64	♂ =	Periclistus.
<b>harringtoni</b>	Ash. '87, p. 146	♀	(Canada). (Gall unknown.)
<b>laciniatus</b>	Gill. '91, p. 194	♂ ♀	Silphium laciniatum, Ill. Summer. Gall on receptacle.
<b>leavenworthii</b>	Bass. '00, p. 310	♂ ♀	Lactuca species, Va. Winters. Spring. Stem swollen.
<b>mulgedicola</b>	(Ash. '97, p. 133	♂ ♀)	Aulacidea bicolor Gill.
<b>nabali</b>	Brodie '92, p. 12	♂ ♀	Nabalus, Toronto, Mass. Winters. Early June. Cells under bark at crown. Aulacidea.
<b>pirata</b>	O. S. '63, p. 42-43	♂ ♀ =	(Periclistus). (Prenanthes altissima, P. serpentaria.)
<b>pisum</b>	Walsh '70, p. 73	♂ ♀	Lygodesmia juncea, Neb., Colo. Winters. Mid-May. Pea size on stems.
<b>podagræ</b>	Bass. '90, p. 92	♂ ♀	Lactuca canadensis, Mass., R. I., Conn. Winters. May. Stem swell- ing. Aulacidea.
<b>rufipes</b>	Cameron '84, p. 485	♀	(Mexico). (Gall unknown.)
<b>rufus</b>	Gill. '91, p. 195 (Antistro- phus)	♂ ♀	Silphium, various species, Ill. Cells only; no gall.
<b>silphii</b>	Gill. '91, p. 192 (Antistro- phus)	♂ ♀	Silphium, Ill. Winters. Late May. Swollen stalks at tip. A. leavenworthi Bass.
<b>semipicea</b>	Harr. '41, p. 400	♀ =	Periclistus.
<b>sonchicola</b>	Ash. '97, p. 134	♂ ♀	Sonchus oleraceus, Canada, N. C. June. Swelling at top of stalks. Aulacidea podagræ Bass.
<b>sylvestris</b>	O. S. '63, p. 37-38 (F. Can., vol 2, p. 551)	♂ ♀ =	Periclistus.

## AULACIDEA (Ash. '97c, p. 68)

<b>mulgedicola</b>	Ash. '97, p. 133 (Aulax)	♂ ♀	Mulgedium acuminatum, D. C. Late Jan. Stem swollen within. Aulacidea bicolor Gill.
<b>solidaginis</b>	Girault '03, p. 323	♂ ♀	Solidago species, Va. Winters. Early June. Stem swollen. Aulacidea podagræ Bass.
<b>tumida</b>	Bass. '90, p. 92	♂ ♀	Lactuca canadensis, Mass., Conn. N. Y. Winters. May. Stem swelling. A. podagræ Bass.

## DIASTROPHUS

bassetti	Beut. Cat., p. 248, pl. 9, fig. 7	♂	R. canadensis, N. Y., N. J., Mass., R. I. Gall at crown of stem.
cuscutæformis	O. S. '63, p. 39	♂ ♀	R. villosus, Mass., R. I., Ind., Neb., Md., N. Y., N. J., Ill. Winters. Late May. Mossy galls on stem in belt.
glechomæ	Linne (Cynips)	♀	= Liposthenus (Ash.). Aulax
fusiformans	Ash. '90, p. 13	♀	Potentilla species, Colo. Stem swelling.
kincaidii	Gill. '93, p. 110	♂ ♀	R. nutkanus, Wash. Stem swelling.
minimus	Bass. '00, p. 325	♂ ♀	P. canadensis, Mass. Blisters on stems. D. niger Bass.
niger	Bass. '00, p. 324	♂ ♀	P. canadensis, Mass. Winters. Early June. Stem swelling.
nebulosus	O. S. "Stettin," p. 415 (F. Can., vol. 2, p. 550)	♂ ♀	R. villosus, R. strigosus, R. vitis-idea, Canada, Mass., R. I., Conn., Ohio, Mo., D. C., Fla., Ind. Winters. Late May. Stem swelling.
piceus	Prov. '87, p. 165	♂ ♀	(Gall unknown).
potentillæ	Bass. '64, p. 689	♂ ♀	= Gonaspis (Ash. '97b). (Round axil gall.)
quinquecostatus	Prov. '83, p. 19-20	♂ ♀	(Rubus strigosus, Toronto). (Gall unknown.)
radicum	Bass. '70, p. 98	♂ ♀	Rubus villosus, R. strigosus, Mass., Conn., R. I., N. Y., Mich. Winters. Late May. Root-gall.
scutellaris	Gill. '91, p. 191	♀	= Gonaspis (Ash. '97b).
similis	Bass. '81, p. 95	♀	= Liposthenus glechomæ (Mayr '02). (From Nepeta glechoma.) Aulax glechomæ
turgidus	Bass. '70, p. 99	♀	R. strigosus, Conn., Mass. Winters. Stem swelling.

## LIPOSTHENUS

glechomæ	Linne (Cynips)	♀	Nepeta glechoma, Europe, N. Y. Globular; in axils. Aulax
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## GONASPIS (Ash. '97b)

potentillæ	Bass. '64, p. 689 (Diastrophus)	♂ ♀	Potentilla canadensis, Mass., R. I., Conn., N. Y., N. J. Winters, May, June. Globular, axillary.
scutellaris	Gill. '91, p. 191-192 (Diastrophus)	♀	Ill. May. (Gall unknown.)

## TRIBALIA

batatorium	Walsh '64, p. 470 (F. Can., vol. 2, p. 16)	♀	Rosa species, Ottawa, Ill. Gall on roots. Rhodites radicum O. S.
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## RHODITES

<b>arefactus</b>	Gill. '94, p. 157	♂ ♀	Rosa species, Colo. May 23. Stem swelling.
<b>bicolor</b>	Harr. '41, p. 399 (Cynips)	♂ ♀	R. lucida, R. rubiginosa, Canada, Cal. Ind., Miss., Conn., R. I., Mass., Me., Ala. Winters. June. Spiny, globular; on leaves.
<b>carolina</b>	Ash. '87, p. 133, 148	♀	R. carolina, N. C. Globular, mealy; on leaf. R. ignotus O. S.
<b>dichlocerus</b>	Harr. '41, p. 399 (Cynips)	♂ ♀	Rosa canina, R. carolina, Mass., R. I., N. Y., Ind., Fla. Winters. Early June. Elongate stem swelling.
<b>fulgens</b>	Gill. '94, p. 159	♀	(Colo., S. D.). (Gall unknown.)
<b>fusiformans</b>	Ash. '90, p. 14	♂ ♀	R. arkansana, Colo. Stem swelling.
<b>globulus</b>	Beut. Cat., p. 247	♂ ♀	Rosa carolina, Mass., R. I., Conn., N. Y., Ind. Winters. Oval at tips of stems. R. globuloides Beutm.
<b>gracilis</b>	Ash. '97, p. 135	♂ ♀	Rosa species. (Mich., Iowa (?). Like beet seed.) May 7.
<b>ignota</b>	O. S. '63, p. 43-49	♂ ♀	R. carolina, R. nitida, Mass., Conn., N. Y., Md., Fla., Colo. Winters. Late May. Globular, mealy; on leaf.
<b>lenticularis</b>	Bass. '90, p. 59	♂ ♀	R. lucida, Mass., N. Y. Dises in leaf parenchyma. R. rosæfolii Ckll.
<b>multispinosa</b>	Gill. '90, p. 25	♂ ♀	Rosa species, Iowa. Spinose stem swelling.
<b>nebulosus</b>	Bass. '90, p. 63	♂	R. carolina, R. blanda. Globular on leaves.
<b>neglecta</b>	Gill. '94, p. 158	♂ ♀	Rosa species, Colo., Mich., Iowa. May. Swelling of stem.
<b>polita</b>	Ash. '90, p. 14	♂ ♀	R. californica, Cal., Colo., Dakota, Wyo. Globular on leaves.
<b>radicum</b>	O. S. '63, p. 42, 46	♂ ♀	Rosa carolina, etc. Canada, Mass., Conn., Ind., Colo., Ohio, N. Y. Gall on roots.
<b>rosæ</b>	Linne (F. Can., vol. 2, p. 549)	♂ ♀	Various roses, Europe, Eastern and Southern U. S. Winters. Early June. Mossy gall on stems.
<b>rosæfoliæ</b>	Ash. '90, p. 13	♀	R. arkansana, Colo. Dises on leaves.
<b>similis</b>	Ash. '97, p. 136	♂ ♀	Rosa species, Wyo. Reniform on Twigs. (Like variabilis Bass.) R. arefactus Gill.
<b>spinosissima</b>	Gill. Bull. Iowa Exper. Sta.	♂ ♀	= Rhodites multispinosa.
<b>tumidus</b>	Bass. '90, p. 60	♂ ♀	Rosa species, Utah. End of branch becomes sort of cone. = Rhodites bicolor.
	Townsend '95, p. 272, 307		

## CYNIPIDAE

<i>utahensis</i>	Bass. '90, p. 62	♂	<i>Rosa</i> species Utah. Gall on roots(?) (or near ground).
<i>verna</i>	O. S. '63, p. 47	♂ ♀	<i>Rosa rubiginosa</i> ; <i>R. lucida</i> , D.C., N.Y. Oval swellings of stems.
<i>variabilis</i>	Bass. '90, p. 61	♂ ♀	<i>Rosa</i> species, Utah. Reniform on stems and leaves.
<i>tuberculosa</i>	O. S. "Stettin," p. 415	♂ ♀	<i>Rosa</i> species, D. C. Stem gall. <i>R. vernus</i> O. S.

## ASCLEPIADIPHILA

<i>stephanotidis</i>	Ash. '97c, p. 263	♂ ♀	<i>Stephanotis</i> species, Ore., Mo. Pea-shaped on stem. <i>Aulax pisum</i> Walsh
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## GILLETTIA (Ash. '97b)

<i>taraxaci</i>	Ash. '97b, p. 69	♂ ♀	<i>Taraxacum densleonis</i> , Minn. Late March. Swollen petiole. <i>Aulax</i>
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## SOLENOZOPHERIA (Ash. '87)

<i>vaccinii</i>	Ash. '87, p. 149	♀	Various species <i>Vaccinum</i> , Gaylussacia, D. C., Mass., Fla. Winters. Late Feb. in Fla. Reniform twig gall.
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## ADDITIONAL—Beut. '07b:

<i>Andricus davisi</i>	♂ ♀, p. 463-464, pl. 37, fig. 1-6	Q. nana, N. J. Spring. Woody, clustered, polythalamous.
<i>Andricus wheeleri</i>	p. 464, pl. 37, fig. 7-9	♀ Q. (?), Ariz. Potato gall.
<i>Andricus coronus</i>	p. 456-464, pl. 37, fig. 10	♀ Q. palustris, Q. aquatica, N. Y., Ga. Spring. Fluted, non-clustered on stems.

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## SUPPLEMENTAL LIST OF AMERICAN GALL-MAKING INSECTS

### ALDER (*Alnus*)

30. Alder wart gall. Suspect this to be *Eriophyes lævis*—Nalepa, p. 7, Connold, p. 140, Mass. June.  
Warts of yellow or brown color; upper side of leaf, plate 6, 30.
39. *Cecidomyia serrulatæ*. O. S. '67, p. 198-199, Mass. Apr. *Alnus serrulata*. Leaves of bud deformed and aborted, plate 6, 39.  
*Dasyneura serrulatæ* O. S.
216. *Exoascus amentorum*. Alder, Mass. June. Distorting and forming tongue-like outgrowths on aments.

### ANDROMEDA

225. *Exobasidium andromedæ*. Andromeda, Mass. June. Large, hollow, bladder-like, lobed growth tinged with reddish brown; May apple, plate 6, 225.
- 250B. *Exoascus*. Andromeda. Main stem enlarged to twice its normal size and an outgrowth of branches at points of infection; plate 5, 250.

### ASH (*Fraxinus*)

89. *Cecidomyia*. *Fraxinus americanus*, Mass. Appears May. On under side of mid-rib, opening at top. Distorts leaves so that they resemble a mass of bean pods, plate 6, 89.  
*Dasyneura tumidosæ* Felt.
138. *Phytoptus* (?). Packard '90, p. 555. Ash, July. "Deforms leaves and twigs." Much like the willow mop, plate 6, 138.  
*Eriophyes* (?) *fraxinifloræ* Felt.
197. *Cecidomyia pellex*. O. S. '61, p. 419, *Fraxinus americana*, Mass. June. On leaf; globular, 5 mm. in diameter above; smooth area below.
198. *Eriophyes fraxini*. Ash, Mass. June. Leaves covered with warts above and elevated areas below. Subdivided by irregular, hairy curtains within gall, plate 6, 198.
240. *Cecidomyia*. Ash petiole. July. Enlargement due to excavation of inner side by white cecidomyid, plate 6, 240. Similar to 194.
266. *Eriophyes*. Ash, Mass. July. Leaf gives out from veins near apices, tufts of filaments or accessory blades, plate 6, 266.  
(?) *Eriophyes fraxinifloræ* Felt.

### ASTER

50. Tomentose aster gall. Aug. Mass. Ovoid on end of twigs. Open at summit showing irregular, white, succulent mass. Several vertical cells in each gall, plate 7, 50.  
*Rhopalomyia* (?) *thomi* Felt.
123. *Cecidomyia*. *Aster corymbosa*, Mass. Sept. Elongated oval enlargements of twigs of flower stalk. Orange colored larva is constant, plate 6, 123.  
*Neolasioptera ramuscula* Beut.
153. *Cecidomyia*. Aster, Mass. Gall in flower-head of *A. novæangliæ* (?) resembling *Dasyneura solidaginis*. Inner portion of flower head is converted into a leaf tuft.  
(?) *Asphondylia monacha* O. S.

321. { *Choristoneura ramuscula* Beut. '07, p. XVII, fig. 7-8, *Aster patens*.  
       { *Rhopalomyia astericaulis*. Felt. Mass. Ovoid, swelling of twigs.  
           *Neolasioptera ramuscula* Beut. and *Rhopalomyia astericaulis* Felt.
322. *Gnorimoschema g-asteriella*. *Aster corymbosa*. Mass. June. Ovoid, hollow stem gall, larva very small. Plant not 6 in. high.

BALSAM (*Abies*)

299. *Cecidomyia. Impatiens fulva*. Mass. July. Starts as a swelling of mid-rib of leaf near base in mid-July, later extends to the base of the blade so that it appears as if on the petiole; ovoid, 1 cm. x 3 mm. Mature by Sept.  
       *Lasioptera impatientifolia* Felt.
284. *Cecidomyia impatientis*. O. S. '67, p. 204. *Impatiens fulva*, N. H., Aug. Gall is a deformation of a flower bud made imperfect. Within succulent, containing numerous cells and slender, dark orange larvæ.

BAYBERRY (*Myrica*)

157. *Eriophyes* (?). Bayberry, R. I. Abort of branchlet making a witchbroom.

BEECH (*Fagus*)

31. Beech leaf fungus. *Phytoptus* species, N. H., Aug. Silvery or russet scurf of clavate hairs.

BIRCH (*Betula*)

32. Fungus of Black Birch. *Phytoptus* species, Mass., June. Silvery or crimson scurf of clavate hairs.
111. *Eriophyes* (?). Fungus. White birch, Mass. July. Areas of brownish yellow scurf on leaves.
140. *Eriophyes*. *Phytoptus* species, *Betula lenta*, Mass. Aborts branches to a dense clump of buds, plate 7, 140.  
       *Eriophyes* species.

BLACKBERRY (*Rubus*)

87. *Lasioptera nodulosa*. Beut. '07, p. 397, pl. 15, fig. 5. *Rubus villosus*, Mass., R. I. Sept. Series of oval enlargements of stem; multicellular. Cells confluent and woody at center, plate 7, 87.
292. *Cecidomyia farinosa*. O. S. '67, p. 204. *Rubus villosus*, Mass. Sept. On mid-rib of leaflets near base of blade 1-1.2 cm. wide; irregularly rounded, surface crackled and very scurfy. Cells are small and basal, plate 8, 292.  
       *Lasioptera farinosa* O. S.

BOX ELDER (*Negundo*)

148. Twig mop on box elder. Mass., R. I. July.

BUTTON BUSH (*Cephalanthus*)

29. Button Bush gall. Mass. July. Warty areas on leaf, tomentose at summit; depressed below as if eroded, plate 8, 29.  
       Unknown.

CHERRY (*Prunus*)

9. *Eriophyes serotinæ*. Beut. Cat., p. 278, pl. 16, fig. 7. Cherry species. Mass. May, June, plate 8, 9.  
(?) *Eriophyes padi*, Nalepa variety.
93. *Cecidomyia serotinæ*. Cook '05, p. 838. Wild cherry, R. I., Mass. June. O. S. '70, p. 346-347. Aug. At end of main or lateral twigs; much scarred and distorted, plate 7, 93.  
Not reared.
215. *Plowrightia morbosa*. Wild plum and cherry. Mass.
223. *Cecidomyia virginianianæ*. Lintner '06, p. 313. Wild cherry fruit. Mass. July. Causes cherry to develop abnormally and destroys the seed. Also found on choke cherry, plate 7, 223.  
*Contarinia virginianianæ* Felt.
250. Fungus (?). Wild cherry. Mass. July. Leaf elevated into irregular, round swellings with cavity below, plate 5, 250.
327. *Cecidomyia*. Choke cherry. Leaf folded on mid-vein, fold rugosely inflated, plate 8, 327.  
*Mycodiplosis cerasifolia* Felt.

CHESTNUT (*Castanea*)

189. *Cecidomyia*. Chestnut leaf. Mass. June. Oval swelling of lateral vein on under side of leaf, plate 8, 189.  
Known, though not reared; taken at Poughkeepsie, N. Y.
193. ———. Chestnut leaf. Mass. June. Minute, round, pale elevations above.

CHOKEBERRY (*Pyrus*)

285. Fungus. *Pyrus arbutifolia*. Mass. Aug. Above slight depression surrounded by deep crimson areola 4-6 mm. in diameter; dull purplish areola below, single or clustered turret galls, 3 mm., tall tapering to apex with terminal orifice fringed with slender white hairs of pale yellow; summit brownish, plate 8, 285.

CINQUEFOIL (*Potentilla*)

83. ———. *Potentilla canadensis*. Oct. On under side of mid-rib and petiole of leaf, moniliform, plate 8, 83.  
*Gónaspis potentillæ* Bass.

## CLEMATIS

35. ———. Stem gall of clematis. Wild clematis. Mass. Oct. Ovoid, tapering at either end. Single central cell; dipterous, plate 8, 35.  
Dipterous, probably the work of an *Agromyza*.
65. *Cecidomyia*. *Clematis virginiana*. Mass. Oct. Clustered, reddish tomentose gall. Each flower stalk forms an irregular lobulated cup open above and guarded by dense pubescence, plate 7, 65.  
*Contarinia clematidis* Felt.

ELDER (*Sambucus*)

120. *Cecidomyia sambuci*. Beut. '07, p. 396, *Lasioptera sambuci*. Felt (?). Elder, *Sambucus canadensis*. Mass., R. I. Low, irregular, rough elevations on stem, plate 8, 120.  
*Neolasioptera sambuci* Felt.

208. *Cecidomyia umbellicola*. O. S. '70, p. 52. Elder, *Sambucus canadensis*. Mass. June. On umbels of common elder; scattered buds are enlarged to white capsules. Larva 2 mm. long, orange, plate 8, 208.  
*Youngomyia umbellicola* O. S.
217. *Puccinia*. *Sambucus canadensis*. Mass. June. Midribs of leaf, petiole and peduncles. 2 x 1-4 in. in diameter. Yellow from cluster cups of rust.
298. *Eriophyes*. *Sambucus canadensis*. Mass. Sept. Some of terminal leaves dwarfed. Margins of leaves involute so that the under surface is exposed to view from above. This roll is more hairy than the normal.  
*Arthrocnodax sambucifolia* Felt. Probably preying on *Eriophyes*, deforming the leaves.

ELM (*Ulmus*)

25. *Colopha ulmicola* = Elm Cockscomb. White elm, *Ulmus americanus*. Mass. June. Upper side of leaf light green with brown summit-orifice elongate, plate 8, 25.
26. *Cecidomyia ulmi*. Beut. '07, p. 387, pl. 13, fig. 5, ♂ ♀, *Ulmus americanus*. June, July. Mass. Warts at base of lateral veins distorting young leaves. Rib gall, plate 10, 26.  
*Phytophaga ulmi* Beutm.
187. *Eriophyes ulmi*. Packard '90, p. 281-282. White elm, *Ulmus americana*. Mass. June. On leaf; finger-like protuberances above and depressed area below with mouth fringed by white hairs. Closely resembles No. 181 on linden.
211. *Pemphigus ulmi-fusus*. Cook '05, p. 849. Elm. Mass. June-July. On upper side of leaves of *Ulmus fulvus*. From 1-5 cm. in height. Summit pointed or indented. Mouth very small with thin, leathery walls, plate 9, 211.  
*Pemphigus ulmi-fusus* Walsh.

## FERN

191. *Tineidæ*. *Pteris aquilina*. Mass. June. Lateral stem swells and curls over making a bunch of the frond veins.

GRAPE (*Vitis*)

18. Crimson Button of Grape. June, July, Aug. Mass. Elevation with apical tuft of pubescence which is ensanguined, plate 8, 18.
19. *Phytoptus vitis* (Landois). Elevated gall of grape leaf. June. Mass. Various grapes, plate 9, 19.  
Coleopterous, taken at Syracuse and Newport, N. Y., unknown.
27. *Lasioptera vitis*. O. S. '67, p. 201. Grape tendrils, stems and leaves. Late August, plate 9, 27.
144. *Eriophyes*. Grape leaf. Mass. Red patches of clavate hairs on upper side of leaf.
232. *Cecidomyia viticola*. O. S. '67, p. 202, Riley, '70, p. 113-114. Grape leaf. Mass. Aug. Cylindrical, tapering to a tip which is often decurved; faint, longitudinal ribs, color green and very ruddy. Length 5-8 mm. Diameter at base 3 mm., occasionally larger, plate 10, 232.
275. *Cecidomyia pomum*. Walsh '69, p. 106, Riley '73, p. 114. Grape. Mass. Aug. Probably modified leaf or tendril, like hazel nut when small, when large oval and heavily ribbed, green, succulent, polythalamous, plate 9, 275.  
*Schizomyia pomum* Walsh.

297. *Cecidomyia*. Grape petiole gall. Wild grape. R. I. Sept. The petiole either in middle or nearer blade of leaf is swollen to form an elongate or abruptly oval swelling. Sectioning: the wood is found thickened and the pith cavity enlarged pari-passu. Larvæ in pith, plate 9, 297.  
*Asteromyia petiolicola* Felt.

## GRASS.

1. *Cecidomyia agrostis*. O. S. '67, p. 204-205. Grass. Resembles aments of hop, plate 10, 1.  
*Asteromyia agrostis* O. S.

GOLDENROD (*Solidago*)

41. *Asphondylia monacha*. O. S. '70-'71, p. 347, *Solidago*. Mass. Aug. Aborted buds forming tufts or sprays of short leaves, the central pair making an oval cell in which the larva lives, plate 9, 41.
64. *Gnorimoschema gallæsolidaginis*. Busck '05, p. 824-825 = *Gelechchia gallæsolidaginis* Riley. Goldenrod stem gall. Mass. June, Aug., plate 10, 64.
88. *Dasyneura* (?) *solidaginis*. O. S. '61, p. 418. *Solidago*. N. H. Aug. Beut. Cat., p. 271. A bunch gall with inner leaves linear. Central cell solitary or several together, plate 9, 88.  
(?) *Rhopalomyia solidaginis*.
94. *Trypeta solidaginis*. (*Eurosta* gall.) Beut. '04, p. 34. Mass. Dec.-Jan. Loew '74, p. 279-280 (F). Abrupt oval swelling of stem, plate 9, 94.  
*Eurosta solidaginis* Fitch.
109. *Cecidomyia carbonaria*. O. S. *Solidago*. Mass., R. I., N. H. June-July. Yellowish, polished, elevated areas with dark border, plate 10, 109.  
*Asteromyia* (?) *rubra* Felt.
124. *Lasioptera tumifica*. Beut. *Solidago* species. Mass. Late May. Rough, subglobular, frequently excentric on stem, plate 9, 124.  
*Lasioptera solidaginis* O. S.
149. *Pædisca saligneana*. Moth. *Eucosma scudderiana* (Clem) Kellicott Canad. Entom. '78; Riley '70, 2 Rept., p. 134-135. *Euryptychia saligneana* (Clem). R. I., Mass. May. Gall like *Gn. gallæsolidaginis* but smaller and in or near flower-head, plate 9, 149.  
*Eucosma scudderiana* Clem.
164. *Cecidomyia hirtipes*. O. S. '67, p. 195. Goldenrod. Mass., R. I. May. Large swelling of terminal bud resembling a dried prune in texture; hard center, plate 9, 164.  
*Rhopalomyia hirtipes* O. S.
248. Rust on *solidago* and *cratægus* fruit enlarging them. Warty, white threads extruding from each pustule in which spores are held. Has cecid. larvæ, but may be fungus, plate 9, 248.  
*Puccinia solidaginis* Peck.
268. *Cecidomyia*. *Solidago*. Mass. July. Globular on root stalk, 6 mm., somewhat pointed at apex, brown in color and with crackled and scaly surface. Very fleshy, plate 9, 268.  
Unknown, unless it be a young gall of *Rhopalomyia hirtipes* O. S.
311. ————. *Solidago* root, Apr. Gall at crown or on root-stock, oval, prostrate, succulent, wall scurfy, thick, fleshy; cavity large, irregular. Emerges at apex, plate 10, 311.

312. *Eurosta reticulata*. Solidago shoots. Apr. Hollows out base of new growth aborting the shoot, making an elongate, onion-like gall, plate 10, 312.
313. *Rhopalomyia thompsoni*. ♂ ♀. Solidago. Apr. Fleshy and elastic, succulent, irregularly ovate or globular. Cells near rind of gall, center usually clear, plate 10, 312.
314. *Cecidomyia*. Solidago. Emerges late May. Small, bud-like, ovoid, hard-shelled gall; near ground in clusters usually, lateral. May be 313 above ground, plate 9, 314.  
*Rhopalomyia bulbula* Felt.
315. *Eurosta*. Solidago. Swelling of new shoots occasionally aborting them; central cavity. Emerged June, plate 10, 315.  
*Eutreta sparsa* Wied.

HACKBERRY (*Celtis*)

56. *Pachypsylla celtidis-mamma*. Riley Canad. Entom. '83, fig. 7. Hackberry. Packard 5 Rept. '90, June-Sept. R. I., plate 10, 56.
106. *Pachypsylla c.-vesiculorum*. Packard 5 Rept. '90 (n. sp.). *Celtis*. R. I. June. Small blisters on leaf.

HAZEL (*Corylus*)

195. *Cecidomyia*. Hazel. Mass. June. Elevations distorting leaf. Hairs thick and long, gland-tipped, crimson above and white below. Similar specimen found on poplar.  
*Lasiopteryx coryli* Felt.
196. *Eriophyes*. Hazel. Mass. June. Buds along stems aborted so that leaf never grows and the bud becomes globular. 5 cm. in size, plate 11, 196.  
*Eriophyes* taken at Nassau.

HICKORY (*Carya*)

11. *Dactylosphæra depressum*. Shimer '69, p. 389-390. Gall No. 4, ♀. *Carya*. Mass. June.  
*Phylloxera depressa*.
20. *Phylloxera caryæ-fallax*. Riley '75, p. 118. Walnut, Duncce-cap. Mass. Packard '90, p. 323. June. Conical mass with apical tuft, plate 11, 20.
23. Fungus on leaf of hickory. *Carya alba*. Mass. June. Yellowish area above; white scurf below, plate 11, 23.
84. *Phylloxera caryæcaulis*. Fitch 1 Rept., p. 155-159. *Carya*, Mass., N. H. Late June. On petioles and main veins of leaves. Succulent, depressed, ovoid, with central pit. Dark green. Often confluent and utterly distorting the branch tips, plate 11, 84.
114. *Cecidomyia holotricha*. Hickory. Mass. Aug. Onion-shaped, on under side of leaf. Variable in form, but the pendent center of inner chamber is constant. Golden brown. Appears distinct from No. 242, but may be confused with No. 256, plate 12, 114.  
*Caryomyia holotricha* O. S.
130. *Phylloxera caryæ-globuli*. Packard '90, p. 322. *Carya*. Mass. Round, fleshy, thick on leaf. See No. 328, plate 12, 130.
131. *Cecidomyia tubicola*. ♂ ♀. *Carya*. Mass. June-July. Diameter 1-8 in. Central chamber and outer rampart, plate 10, 131.  
*Caryomyia tubicola* O. S.
194. *Cecidomyia*. Petiole gall. *Carya*. Mass. June. Slight swelling both of petiole and adjacent stem.



199. *Phylloxera caryæ-venæ*. Packard '90, p. 322. *Carya*. Elevations along veins; ruddy above with hairy mouth below; serrate borders.
203. *Phylloxera rimosalis*. Pergande '04, p. 217-220, pl. 4, fig. 24, pl. 9, fig. 54. *Carya*. On leaf. Galls nearly hemispherical or globular above; conical or globular below, plate 10, 203.
204. *Phylloxera foveola*. Pergande '04, p. 200-203, pl. 3, fig. 15-16. *Carya*. Mass. June. Small, elevated above with thin roof that is centrally depressed.
205. *Phylloxera avellana*. Pergande '04, p. 228-230, pl. 5, fig. 30-31, pl. 6, fig. 32-36, pl. 11, fig. 79-81. *Carya*. June. On leaf. Flat, round areas with slight annular depression at margin on upper side; below, rounded, splitting bracts. When gall is very young it shows a white tuft at end. Fly certainly *avellana*, plate 12, 205.
206. *Phylloxera deplanata*. Pergande '04, p. 205-208. *Carya*. June.
218. *Diplosis caryæ*. O. S. '67. *Carya*. Mass. June-July. On leaf. 2 x 2 mm. above. Oval or sub-globular gall attached by a small base and crowned by nipple and areola. Resembles a pot and cover, plate 11, 218.  
*Caryomyia caryæ* O. S.
220. *Cecidomyia*. *Carya*. Mass. July. On leaf. Convex above; conical below; solitary or clustered. Resembles *Ph. conica* gall, but is cecidomyious.  
Possibly the *Cecidomyiid* larva observed in this gall may prey on *Phylloxera*, which may be the true maker. It would be necessary to see the adult.
221. *Phylloxera caryæ-foliæ*. Packard '90, p. 322. *Carya*. Mass. July. Above leaf a slender cone 5 mm. splitting into bracts at apex; centrally a pit and bunch of short, fine filaments.
226. *Cecidomyia caryæcola*. O. S. *Carya*. Mass. July. When young, very elongate, when older, onion-formed. Nearly 8 mm. tall, 4 mm. at base, plate 11, 226.  
(?) *Caryomyia caryæcola* O. S.
227. *Cecidomyia*. *Carya*. July. Depressed area of yellowish tint 1 mm. in diameter above; globular, flattened on top with deep apical pit below. Cavity large, walls thin and leathery. Short filaments depend into cavity from apical pit, plate 12, 227.  
*Caryomyia thompsoni* Felt.
228. *Cecidomyia*. *Carya*. July. Slightly elevated brownish blister on upper side of leaf; on under side (juv.) a flattened, white gall; (aet.) cup-shaped, surface above slightly depressed, central spine larger. Diameter 5 mm., height 2 mm. Hickory spangles, plate 13, 228.  
Unknown.
229. *Cecidomyia*. *Carya*. July. On lower side of leaf an elongate spur attached by broad base which is cut into teeth at margin. Not over 2 mm. tall.
230. *Cecidomyia*. *Carya*. July. On leaf. When young an elevated, rounded dull-colored blister with central dark spot from which a capsule develops when cut; when old the ventral blister ruptures and the capsule is forced out, plate 11, 230.
231. *Cecidomyia*. Seed gall. *Carya*. July. Seed-like on under side of leaf, 1-2 mm. long, erect, cylindrical, tapering slightly to a point, plate 11, 231.  
*Caryomyia tubicola* O. S.
241. *Cecidomyia sanguinolenta*. *Carya*. Mass. July. Attenuate, conical, base circular, white or deep carmine red; height 3 mm., diameter at base 1 mm., plate 11, 241.  
*Caryomyia sanguinolenta* O. S.
242. *Cecidomyia*. Woolly gall. *Carya*. Mass. June. On under side of leaf scattered over surface, but more often clustered along mid-vein, sometimes distorting leaf. Light area or blister above. Solid, more or less spherical covered with long, white pubescence. There is no reason for regarding this as a confluent 114, the heavy wall and curled wool etc. are against it, plate 13, 242.  
*Caryomyia holotricha* O. S.

243. **Cecidomyia**. Flask gall. *Carya*. Mass. July. 3 mm. long on leaf, flask-shaped, prostrate, white or pink. Fairly constant recurvation, plate 12, 243.  
Possibly *Caryomyia sanguinolenta* O. S.
244. **Cecidomyia**. *Carya*. Mass. July. On leaf; crimson-green, smooth and small depression above; globular with slight point at apex below. Dark crimson, shining and sticky to touch. 4 mm. diameter. Single, small, white larva, plate 12, 244.  
*Caryomyia caryæ* O. S.
245. **Cecidomyia**. *Carya*. Mass. July. Sub-globular, surface at all stages with minute rugosities, glutinous, yellow. Wall 1-3 diameter, leathery, larva white, plate 11, 245.  
*Caryomyia caryæ* O. S.
251. **Nectria ditissima**. *Carya*. Hickory. "Large, warty, cancerous growth." *Nectria ditissima*.
253. **Phylloxera caryæ-septum**. Packard '90, p. 322. *Carya*. Mass. July. Above leaf attenuate, conical, 4-5 mm. split at apex to filaments with an orifice; below similar but thinner.
- 254-5. **Hormomyia caryæ**. O. S. ♂ ♀. *Carya*. Mass. July. When young much like *Diplosis caryæ*; when old, a larger gall with thinner walls, very brittle. Yellow. Gall resembles a globular onion in translucency and color. Very small. It also resembles a young *tubicola*, but as it grows it swells out almost to shape of *Diplosis caryæ*, attached, however, by broader base and is more elevated. Very variable gall, plate 12, 254, 255.  
*Caryomyia caryæ* O. S.
256. **Pseudo-holotricha**. *Carya*. Mass. July. Cavity more basal and less hairy, subglobular, sessile, but may be *holotricha* No. 114.  
Possibly *Caryomyia holotricha* O. S.
257. **Cecidomyia**. *Carya*. Mass. July. Conical, sessile or subsessile at all stages, wall thick, not translucent, slightly pubescent. Numerous on under side of leaves. Strongly elevated above leaf, 1-2 mm. Less tapering than *C. sanguinolenta*, No. 241, plate 12, 257.  
*Caryomyia* (?) *caryæ* O. S.
258. **Cecidomyia**. Double-decker. *Carya*. Mass. July. Hard, rounded, slightly elevated spot above leaf. As gall grows the blister area is lifted up as a roof, plate 13, 258.  
*Caryomyia inanis* Felt probably true producer; *Parallelodiplosis caryæ* Felt, presumably an inquiline.
259. **Cecidomyia**. *Carya*. Mass. July. Resembles "pseudo-diplosis No. 255" at all stages, but is finely pubescent. Wall thin and brittle, plate 12, 259.  
(?) *Mycodiplosis holotricha* Felt.
260. **Eriophyes**. Margin-rolled gall. *Carya*. Mass. July. Margins of leaf rolled toward upper face and much crinkled. Mites live within the fold, plate 10, 260.
274. **Cecidomyia**. *Carya*. Mass. July. Small attachment on upper side of leaf 2 mm. tall. Conical, jug-shaped with apical pubescence and cap.
301. **Phylloxera caryæ-semen**. Packard '90, p. 322. *Carya*. Mass. Sept. 2-3 mm. broad on upper side of leaf; elevation generally globular but quite irregular as to height; central pit usually present, wall opaque; slightly conical with short nipple on lower side breaking into a variable number of pubescent points, plate 13, 301.
308. **Cecidomyia cynipsea**. O. S. '67, p. 193. *Carya*. Subglobular, woody swelling, surface rough with points below. Polythalamous, cells vertical, oblong.
328. **Phylloxera**. *Carya*. June. Galls small up to 8 mm. Semi-globular to quite globular, flat beneath. Orifice more or less transverse, fleshy lips. Wall rather thin but not papery; color pale yellow. Migrant is close to 130.

HOREHOUND (*Lycopus*)

82. *Cecidomyia*. *Lycopus*. Mass. Oct. On stem; smooth, elliptical; tough and solid inside, plate 13, 82.

*Lasioptera lycopi* Felt.

HORNBEAM (*Carpinus*)

179. *Cecidomyia pudibunda*. O. S. '67, p. 202. Hornbeam. Mass. May-June. Found also on black birch. Deep vertical folds of leaf between veins from edge of leaf nearly to mid-rib, plate 13, 179.

HUCKLEBERRY (*Vaccinium*)

55. ———. False flowers of huckleberry. Fungus. *Vaccinium resinosa*. Aborts twig and leaves become white or pinkish.

## IRIS

317. *Agromyza*. *Iris*. Emerges late May. As leaves come up outer leaf bears swollen, ovoid area; checks growth of this leaf but does not affect rest of plant, plate 13, 317.

*Agromyza magnicornis* Loew (See Psyche, August, '07, 14: 74).

LETTUCE (*Lactuca*)

159. *Lasioptera lactuæ*. Wild lettuce. Mass. Gall similar to that of *Aulax tumidus* but is woody internally; solid.

LINDEN (*Tilia*)

73. *Cecidomyia*. *Tilia americana*. Infests the bases of leaves causing a rupture of the bark within whose cap appears a globular, white capsule. This holds the rusty white larva, plate 14, 73.

*Cecidomyia citricola* O. S.

74. *Cecidomyia*. Terminal bud gall. *Tilia americana*. June-July. Terminal bud changed to tuft of leaves, plate 14, 74.

Same as above, probably.

108. *Cecidomyia verrucicola*. O. S. '75, p. 201-202. Linden, Basswood, *Tilia heterophylla*. Mass. June, July. On leaf; wart-shaped, numerous. Alike above and below.

181. *Eriophyes*. Basswood. Mass. May. Finger-like protuberances on upper side of leaf of *Tilia americana*. Entrance to gall on lower side guarded by white hairs, plate 14, 181.

*Eriophyes* (?) *abnormis* Garm.

252. *Cecidomyia*. Linden. Mass. July. Round, thickened area with irregular, thicker, pinkish margins above leaf; a slight central point below, plate 14, 252.

Possibly the developing gall of *Cecidomyia verrucicola* O. S.

300. ———. Linden. Mass. Mid-summer. Circular blister very slightly elevated from margin to center and not sharply defined at margin; 3 mm. diameter. Above and below a variable tuft of slender brown hairs, usually heaviest and longest below.

HONEY LOCUST (*Gleditschia*)

52. *Cecidomyia gleditschiæ* O. S. *Gleditschia triacanthos* ♂ ♀. Honey locust. Mass. Mid-Aug. Makes leaflets of young leaves into pods, plate 14, 52.  
*Dasyneura gleditschiæ* O. S.

LOCUST (*Robinia*)

102. ———. *Robinia pseudacacia*. R. I. Oct. Elongated enlargement of stem, plate 14, 102.  
*Ecdytolopha insiticihana* Zell.

LOOSESTRIFE (*Lysimachia*)

202. *Cecidomyia*. Loosestrife. Mass. Late June. Aborts stem and terminal bud of *Lysimachia quadrifolia*. Summit of stem bears a bud-like body composed of inrolled; thickened, broad leaves, plate 14, 202.  
*Dasyneura lysimachiae* Beut.

MAPLE (*Acer*)

4. *Eriophyes*. Pimple gall. *Acer rubrum*. Mass. May. On leaf, plate 14, 4.  
 (?) *Eriophyes*.
17. *Eriophyes*. Crimson Cushion. Osborn '84, p. 58. Maple leaf. June, July. Mass. Rough crimson areas, plate 14, 17.
22. *Phytoptus acericola*. Garman *Acer saccharinum*. Mass. June. Gall slender and tapers to both extremities, plate 13, 22.
91. *Cecidomyia*. *Acer rubrum*, *A. saccharinum*. Mass. Late June. On rib of leaf distorting same above and below, plate 14, 91.  
 Common, unnamed, not reared with certainty and possibly *Dasyneura communis* Felt.
95. *Aphididæ*. *Acer saccharinum*. Mass. June. Irregular, woody excrescences above and below leaf, plate 13, 95.
177. *Sciara ocellaris*. Packard '90, p. 411–412, pl. 38. *Acer rubrum*. Riley Repts. Entom., p. 202–204, pl. 17. Mass. May. On upper side of leaf; small, conical pustules of pale yellowish, green bordered with an orange scarlet circle outwardly deepening to maroon, plate 14, 177.  
*Cecidomyia ocellaris* O. S.
219. *Rhytisma acerinum* (fungus). *Acer*. Mass. On leaf.
237. *Phytoptus quadripes*. Packard '90, p. 422–424; Garman '83, p. 128–130. *Acer dasycarpum*, Mass. July. Bladder-like pouches above leaf, plate 14, 237.  
*Eriophyes quadripes* Garm.

OAK (*Quercus*)

12. ———. Fungus. Leaves of red and chestnut-oak. Mass. June. Light yellow-green, bloated areas, often corrugated, plate 15, 12.
14. *Cecidomyia niveipila*. O. S. '67, p. 199–200. *Q. nigra*, *Q. alba*, *Q. ilicifolia*, *Q. rubra*, *Q. coccinea*. Mass. May, June, plate 15, 14.  
 The species has not been reared.
15. ———. Oak-leaf. Rivet gall (see 49, plate 15, 15).  
 (?) *Neuroterus* sp.

36. *Cecidomyia pilulæ*. *Asphondylia pilulæ*. ♂ ♀. *Quercus* species. Mass. June. Oak lentil gall on upper side of leaf, plate 15, 36.  
*Cincticornia pilulæ* Walsh.
51. (?) *Cecidomyia*. Button gall. *Q. coccinea*. Mass. Flat, rivet-like brown elevations, plate 15, 51.  
(?) *Cincticornia*.
58. *Cecidomyia pustuloides*. Beut. '07, p. 390, pl. 17, fig. 1. *Q. ilicifolia*, Mass. June-July. Low, flat-topped bladder; green with brown circle above; yellow with small central point of black beneath. Some slightly lenticular, plate 16, 58.  
*Cincticornia pustuloides* Beutn.
60. *Cynipidæ*. *Q. rubra*, *Q. coccinea*. Mass. Sept.-Oct. Soft, *inanis* center; purple-brown. Some are keeled on twigs = *tinctoriæ* Ash. '97, plate 16, 60.  
*Amphibolips* (?) *globulus* Beutn.
80. *Cecidomyia*. *Quercus* species. Mass. Oct. Swelling beneath mid-rib. Large central chamber, plate 15, 80.  
We have this gall. It is not reared. Unknown.
81. *Cecidomyia*. Bordering gall. *Quercus* species. Mass. Oct. Appears June. Greenish rough enrollment of edges of leaves.  
*Cecidomyia* (?) *erubescens* O. S.
90. *Cecidomyia q. majalis*. O. S. '70. Mass. June. Pod-shaped oak-apple. Gall of same type as *Cec. niveipila*, but more thin-walled and bladder-like and never tomentose, plate 15, 90.  
Adult unknown.
121. *Eriophyes querci* (*Phytoptus* species). Garm. '83. Oak species. Mass. Early June. Elevation of leaf above, with densely woolly concavity below.
127. *Cynipidæ*. *Q. rubra*, *Q. ilicifolia*. Over winters. Mass. Irregular bullet gall.  
*Holcaspis globulus* Fitch.
128. *Cecidomyia*. *Quercus* species. Mass., R. I. June. Elongate, hollow crests on mid-rib of leaf, plate 15, 128.  
Unknown.
135. *Cecidomyia*. Oak twigs. Deformation of small twigs. Woody, polythalamous, oval knot; surface mammillate, with globular swelling of the separate chambers. Mass. June.  
*Lasioptera* (?) *querciperda* Felt.
136. ———. *Q. rubra*, *Q. ilicifolia*. Mass., R. I. Shining capsules size of small pea in axils of leaves or in circle about terminal bud of shoot. Polished, yellowish with black dots and brown marbling; cavity large, wall thin. Shelly gall, plate 15, 136.  
Possibly a solitary *Biorhiza forticornis* Fitch, not typical.
139. *Cecidomyia poculum*. O. S. '67, p. 201. Oak spangles. *Q. alba*, *Q. obtusiloba*. Mass., R. I. June-Aug. Very small, cup-shaped, with short stalk, lilac red, powdered white, plate 16, 139.
146. *Eriophyes*. Oak sprouts. *Q. rubra*, *Q. ilicifolia*. R. I., Mass. Late June. Buds aborted, making dense masses of scales like Brussels sprouts, plate 16, 146.
147. *Cecidomyia*. *Q. alba*, *Q. rubra*. Mass., R. I. Leaves gall in Sept. Series of half inch long oval enlargements of twig. Excentric on limb and successive ones run spirally around it, plate 15, 147.  
Probably *Lasioptera querciperda* Felt.

154. **Cynipidæ.** Oak. Mass. April. Gall like *Amphibolips inanis* but kernel is wholly free. No trace of fibers within. Oval central kernel with one exit.
161. **Cynipidæ** or Fungus. *Q. nigra*. Mass. April. Globular elevations on stem of twigs; sessile, very rugose and suggests fungoid growth. Lycoperdon gall, plate 16, 161.
162. ———. Petiole gall. *Q. alba*. R. I., Mass. Aug. Cluster of ovoid cells about 4 mm. long x 2.5 mm. at greatest diameter, plate 15, 162.  
Probably *Holcaspis globulus* Fitch.
163. **Cynipidæ.** *Quercus* species. Resembles *Holcaspis globulus*. Point of attachment small, but not sunk into twigs as in case of *Holcaspis fasciata*.
174. ———. Peach gall. *Q. prinoides*. Mass. April. On petiole. Globular, fleshy; externally rugose, ruddy. Wall 1-3 diameter, plate 16, 174.  
*Andricus* (?) *petiolicola* Bass.
175. **Cynipidæ.** *Q. rubra*, *Q. ilicifolia*. Mass. May 23. Full size, but succulent. June 1st. Falls to ground. On twigs, plate 16, 175.  
(?) *Neuroterus* sp.
176. ———. *Q. niger*. May. Terminal twigs in center of leaf rosette in size from 1-5 mm.; globular, dense, with minute central cell, shining and smooth, and very loosely attached.
183. ———. *Quercus*. Mass. June. Ovoid, pointed at apex; 3 mm. long; evidently a modified terminal bud.
186. **Coccidæ.** Coccid gall. Oak. Mass. June. Heavy swelling on upper side of petiole; on mid-rib sometimes.
207. **Cecidomyia.** *Q. rubra*. Mass. Mid-June. On leaf. 5 mm. long by 2.5 high. Steep-sided crest with wavy, ruddy summit. Cecid. larva within.
236. Petiole gall. Oak species. Enlargement of base of petiole. R. I., Mass. June. 1-2 cm. x 3 mm. Central cell, plate 17, 236.
246. **Cynipidæ.** *Q. prinoides*. Mass. July. On leaf. Perfectly globular but rather strongly attached. Whitish with brown pubescence occurring in spots. Solid with small central chamber, plate 16, 246.  
Unknown.
249. ———. Oak twig. New growth. Main twig dwarfed and killed above gall. Lateral twig much enlarged and extremely so at the various succeeding points of infection.
269. ———. *Q. prinoides*. Mass. July. Globular, fuzzy, externally like No. 246, but has larger cavity, thin walls and seems to be cecidomyious.  
(?) Cynipid.
271. ———. *Q. coccinea*, *Q. ilicifolia*. Mass. July. On lateral veins on upper side of leaf, a minute grey cell loosely fastened to vein and clothed with pale crimson, silky hairs. Sort of rosette 3 mm. in diameter. Probably variety of *C. verrucarum*, only hairs are too regular, plate 16, 271.  
*Neuroterus* (?) *verrucarum* O. S.
273. **Cynipidæ.** *Q. castanea*. Mass. July. On main or lateral veins above leaf. 8 mm. in diameter, globular; surface roughened by minute, conical, red points. Resembles *Philonix pezomachoides*, but cavity is single and large, wall thin and leathery.  
Probably *Philonix pezomachoides* O. S.
276. ———. O. S. '62, p. 255. *Q. alba*, Mass. Aug. Wedge-shaped with base elevated into a point. Small about 1 cm. ovoid, prismatic with clusters usually on under side of petiole. 6-8 cells closely packed, free surfaces have dense, brown, wool pubescence, plate 16, 276.  
Probably *Cynips strobilana* O. S.

277. ————. Oak species. Mass. Aug. (juv.) 2 mm., ovoid, fleshy on veins, apex depressed; (aet.) 2 x 3 mm., attached by narrow base, cylindric, constricted in middle, fleshy, red. Basal segment often smaller than apical, plate 17, 277.  
(?) *Dryophanta* sp.
288. **Cynipidæ.** *Q. coccinea*. On twigs. Appears Sept. 10th, plate 16, 288.  
Possibly *Dryophanta pedunculata* Bass. developing on tender twig.
290. ————. *Q. alba*. Sept. Clustered along mid-vein on under side of leaf; globular, white, covered with long curled brown hairs, 2 mm. diameter, plate 18, 290.  
(?) *Dryophanta ignota* Bass.
294. **Cynipidæ.** *Q. alba*. New growth enlarged; small peripheral cells on twigs.
295. ————. *Q. rubra*. R. I. Along ribs; 2-5 mm., globular, depressed with short central points; short, fine, brownish wool. Identity with O. S. '61, p. 253-254. No. 45 probable, plate 18, 295.  
*Andricus lana* Fitch.
302. ————. *Q. rubra*, *Q. ilicifolia*. Mass. Mature Sept. Clustered, diameter, 3-8 1-2 cm. globular, fleshy, covered with grey wool. Loosely attached to veins by a point and breaks off leaving a star of white hairs about a black point, plate 18, 302.  
*Andricus lana* Fitch.
305. ————. *Q. rubra*. Mass. Oct. Closely resembles 302. Gall red, globular, 2-3 mm. diameter, hard, covered with short, pale, curly wool which rubs off readily, plate 17, 305.  
*Andricus lana* Fitch.
307. ————. *Q. alba*. Mass. Oct. A pale spot with crimson areola above; dull crimson spot in some cases below. When largest 1 mm. long, globular, color deep wine purple, surface very punctate.

OSIER (*Cornus*)

158. **Lasioptera cornicola** Beut. '07, p. 394. Red osier. R. I. April-June. Swelling of stem.  
*Neolasioptera cornicola* Beut.
209. **Lasioptera clavula**. Beut. '07, p. 396, pl. 14, fig. 5. *Cornus paniculata*. Mass. June. At end of twigs on new wood, ovoid, 2 cm. x 1 cm. Larvæ blood red, plate 17, 209.  
*Cecidomyia* species, not reared.

PINE (*Pinus*)

3. **Diplosis pinæ-rigidæ** (n. s.). Pack. '90, p. 798-799, fig. 271 (gall). Me., R. I. Yellow pine. July, Sept., plate 18, 3.  
The species has not been reared, *Cecidomyia*.
54. ————. Packard '90, pl. 853. Spruce. R. I. June. An abort of the twigs which makes a short cone-like growth, plate 18, 54.  
*Chermes abietis* Linn.
283. **Cecidomyia balsamicola**. Lintner '88, p. 60-63, fig. 28. *Abies balsamea*. N. H. Aug. Needles near end of twigs with 2 mm. ovoid swelling, usually but one to a needle. Gall opens above or more rarely along margin of needle by a slit nearly length of gall and provided with tightly appressed lips, plate 17, 283.
318. ————. Cone gall. Spruce. Found on new growth, the leaves forming fleshy scales, under each 1 or 2 aphids, plate 17, 318.  
*Chermes abietis* Linn.



PLUM (*Prunus*)

53. **Eriophyes.** Walsh 1 Rept., p. 43, note. Plum species (n. sp.). N. H. Aug. Pinkish elevations on upper sides of leaf, rarely beneath. On wild plum, plate 17, 53.  
Unknown.

POISON IVY (*Rhus*)

13. **Eriophyes.** On leaf of *Rhus toxicodendron*. Garman '83, p. 134. *Phytoptus* species. Mass. June. Corrugated areas of same color as leaf crowned with paler warts, plate 18, 13.

POPLAR (*Populus*)

21. ———. Wart gall on poplar. Mass. June. On leaf. *Populus tremuloides*—Aspen. Irregular, pale green elevations with scabious depressions below, plate 17, 21.  
*Mycodiplosis* (?) *populifolia* Felt.
113. **Pemphigus** (?). Balsam poplar. Mass. July. Globular at base of leaf.
134. **Pemphigus vagabundus.** Walsh '69, p. 107–108. Poplar. June, plate 19, 134.
210. **Pemphigus populicaulis.** Packard '90, p. 471, fig. 170. Walsh-Riley '68; p. 245. Poplar. Mass. June. Size of bullet above; lip thickened on petiole side only below. Fly *P. populicaulis*, plate 18, 210.
280. **Cecidomyia.** Poplar. Mass. May. Sessile, hard, globular, 3 mm. on veins. Open by slit on under side.  
Possibly same as the following.
281. **Cecidomyia.** Aspen poplar. N. H. Aug. Globular, 1-2 cm., narrowed toward base on top of leaf; below only a slight, rugose, depressed area on mid-rib or lateral veins; walls thick and hard at side of vein. Cell less than 1-3 diameter, plate 18, 281.  
(?) *Mycodiplosis populifolia* Felt.
282. **Eriophyes.** *Populus tremuloides*. N. H. Aug. Buds at end of twigs transformed into a rosette of aborted, pubescent folds, plate 19, 282.
289. **Ectoedemia poputella.** Busck. *Populus tremuloides*. Sept. Globular. 1-2 cm., succulent swelling of petiole at base of leaf blade; sudden, distinct surface, grey-brown and rugose, plate 18, 289.
323. **Eriophyes.** *Populus tremuloides*. June. Scurfy area lighter than leaf on under side or more rarely above.

ROSE (*Rosa*)

261. **Cecidomyia.** Rose. Mass. July. Leaf folded along mid-vein, slightly swollen and forms trough inhabited by larvæ, plate 19, 261.  
*Dasyneura* (?) *rosarum* Hardy.

SHAD-BUSH (*Amelanchier*)

48. **Cecidomyia.** Coral Gall of Shad-bush. *Amelanchier canadensis* July–Aug. Mass. On leaf; erect, hard capsules with rolled tip. Larva is dull salmon in color, plate 19, 48.  
*Hormomyia canadensis* Felt.
222. ———. Rust on *Amelanchier*. July. On fruit, leaf and petioles of berries. Berry becomes five or six times its natural size. Yellow spots on account of clusters of cup spores.

235. **Cecidomyia.** *Amelanchier canadensis*. Mass. July. Conical elevation densely clothed with coarse, short, blue-grey pubescence on upper side of leaf. Extends out as cylindrical turret 5 mm.—opening at apex on under side. Walls leathery, plate 19, 235.

*Hormomyia canadensis* Felt.

251. **Cecidomyia.** *Amelanchier*. Mass. July. On upper side of leaf a slit parallel to lateral veins 6 mm. long with slightly elevated margins; below thin, fleshy, white comb elevation, free margin with short digitations.

*Cecidomyiid*, known, not reared, unnamed.

#### SHEPHERD'S-PURSE (*Capsella*)

224. **Albugo candida.** *Capsella bursa-pastoris*. Mass. July. White, oval and oblong patches. Leaves, stems and pods swollen.

#### SPIRÆA

86. **Cecidomyia.** *Spiræa salicifolia*. Mass. July. Aborts end of shoot into a dense tuft of linear threads.

(?) *Hormomyia clarkei* Felt. This species has been reared from a terminal bud gall on *Spiræa*, though not from the fimbriate one evidently characterized under this number.

104. **Cecidomyia salicifoliæ.** O. S. 2 New N. A. Cec. *Spiræa tomentosa*. Mass., R. I., N. H. Aug. Cells simple, made by edges of leaves folded together (see 262). Plate 20, 104.

*Rhabdophaga salicifolia* Felt.

262. **Cecidomyia salicifoliæ** (?). O.S. *Spiræa*. Mass. July. Leaves near summit of stem are aborted and transformed into pouches with little of blade remaining. Succulent, but walls not very thick. Gall 6 mm. in diameter and 1.5 cm. long. Margins tightly closed except for point near tip of leaf, plate 19, 262.

*Rhabdophaga salicifolia* Felt.

#### SUMAC (*Rhus*)

96. **Pemphigus rhois.** Walsh '69, p. 108. *Rhus typhina* and *R. glabra*. N. H. Sumac tomato gall, plate 18, 96.

97. **Fungus or Eriophyes.** *Rhus copallina*, *R. glabra*. Mass. Oct. Curling end of stalks, plate 19, 97.

#### SWEET FERN (*Myrica asplenifolia*)

267. **Oligotrophus asplenifolia.** Sweet fern. July. Bits of leaf margins rolled under and thickened forming reddish, shining galls about 2 mm. long, plate 10, 267.

*Janetiella asplenifolia* Felt.

#### THORN (*Cratægus*)

180. **Cecidomyia.** Walsh Canad. Entom. '69. *Cratægus crus-gallæ*. Thorn. Mass. Late May. Double crest; along veins near leaf margin with long white hairs on upper side of leaf, plate 18, 180.

*Hormomyia cratægifolia* Felt.

233. **Cecidomyia.** White thorn. Mass. July. Above leaf along mid-rib, 1-3 on leaf; when young, conical, pale protuberance, when mature, a globular gall with deep hole in center and covered with gland-tipped prominences so that it appears mossy. Digitate tufts, plate 20, 233.

*Lestodiplosis cratægifolia* Felt reared, though not the producer.

263. *Cecidomyia*. Blister gall. Thorn. Mass. July. Above slight elevation color of leaf surrounded by dull, purplish areola; below paler than leaf and somewhat wrinkled. Circular gall 5-10 mm. diameter, plate 20, 263.

*Lasioptera excavata* Felt.

264. *Cecidomyia*. White thorn. On leaf = 233. Fleshy base emitting a slender elevation covered with filamentous branches.

333. *Cecidomyia*. Thorn leaf. Mass. July. Lipped, elongate orifice along a vein on upper side; smooth, deep, leathery walled pocket beneath. Probably cecidomyious.

Known, not reared, unnamed.

#### THOROUGHWORT (*Eupatorium*)

40. *Choristoneura perfoliata* (n. sp.). ♂ ♀. Thoroughwort—Boneset. Mass. Oct. Ovoid swelling of stem, plate 21, 40.

*Neolasioptera perfoliata* Felt.

291. *Cecidomyia*. Cone gall. *Eupatorium purpureum*. Mass. Sept. Flower bud transformed into a conical mass of linear scales. Small, orange, inquiline, cecidomyious larva within, plate 20, 291.

*Dasyneura purpurea* Felt.

#### TULIP TREE (*Liriodendron*)

105. *Cecidomyia liriodendri*. O. S. '67, p. 202. Tulip tree. Mass. July. Mahogany brown with darker center, plate 20, 105.

*Contarinia liriodendri* O. S.

#### TUPELO (*Nyssa*)

330. *Eriophyes*. *Nyssa sylvatica* gall. Mass. July. Margin thickened and rolled inward giving a crinkled border which scallops the leaf, plate 20, 330.

331. ———. *Nyssa sylvatica*. Pustular, pale yellow elevation above, 1 mm.; depression with elevation in center below.

#### VIBURNUM

239. *Cecidomyia*. *Viburnum acerifolium*. July. Small blisters equally elevated on each side of leaf, often ringed by crimson line, plate 20, 239.

*Sackenomyia* (?) *viburnifolia* Felt.

#### WILLOW (*Salix*)

37. *Cecidomyia triticoides*. Walsh '64. Willow species. Mass. May-June. Remote resemblance to head of wheat. End of branch aborted making a dense tuft of small leaves, plate 21, 37.

*Rhabdophaga triticoides* Walsh.

38. *Phytoptus* species. Willow, Mass. May. Elevated, irregular masses, single or compound; on upper side of leaf and more rarely below. Both positions on same leaf. Green or red according to host willow, plate 19, 38.

42. *Cecidomyia rigidæ*. Walsh '64, p. 591-598. Willow club gall. Mass. June. O. S. calls this "*Cecid. siliqua*." Egg evidently laid in terminal bud which is excavated by the larva burrowing downward. Top appears to be always open, plate 21, 42.

*Phytophaga rigidæ* Walsh.

43. *Nematus pomum*. Beut. Cat., p. 263-264. Willow. Mass. June. Walsh '66, p. 255-256, ♂ ♀. Rounded, yellowish on under side of leaf. Provancher '82, vol. 13, p. 292. ♀. Saw fly larva; single cell, plate 21, 43.
61. *Cecidomyia verruca*. Walsh '69, p. 226. *Salix humilis*. Mass. Oct. Walsh '64, p. 606. Dome-shaped, glabrous, above; turret-like, below. Cells in level of leaf proper, plate 21, 61.  
*Hormomyia verruca* Walsh.
62. ———. Walsh, '66, p. 227. *S. enigma*. Probably acarus. Willow mop gall. Mass. Oct. Aborted branch; twists to a dense, dark grey mop of dried leaves. Inner ones short and smooth, outer very hairy, plate 21, 62.
70. *Cecidomyia nodulus*. Walsh '64, p. 599-601. Willow species. Mass. May-June. Like club-gall, but less abrupt and does not destroy growth of stem, plate 21, 70.  
*Rhabdophaga nodula* Walsh.
75. *Euura ovum*. Walsh '69, p. 49. *Salix* species. Mass. Oct. Ovoid, scurfy elevations on stem; single cell, plate 18, 75.
98. *Cecidomyia batatas*. O. S. Felt '06, p. 119-122. *Rhabdophaga batatas* Willow, Mass., R. I. May-June. Galls strung along stem; irregular, woody, plate 21, 98.  
*Rhabdophaga batatas* O. S.
107. *Nematus desmodioides*. Walsh '66, p. 257-258. Weeping willow. Mass. Late June. Oval excrescence above and below leaf blade, plate 21, 107.
110. *Cecidomyia strobiloides*. Walsh '66, p. 223. *C. strobiliscus*. Willow species. O. S. '67, p. 203. *C. strobiloides* (n. sp.). Mass., N. H. June-July. Pine cone forms on stem, plate 21, 110.  
*Rhabdophaga strobiloides* Walsh.
238. ———. Willow. Mass. July. Conical, smooth above leaf; fleshy with small cavity below, plate 21, 238.

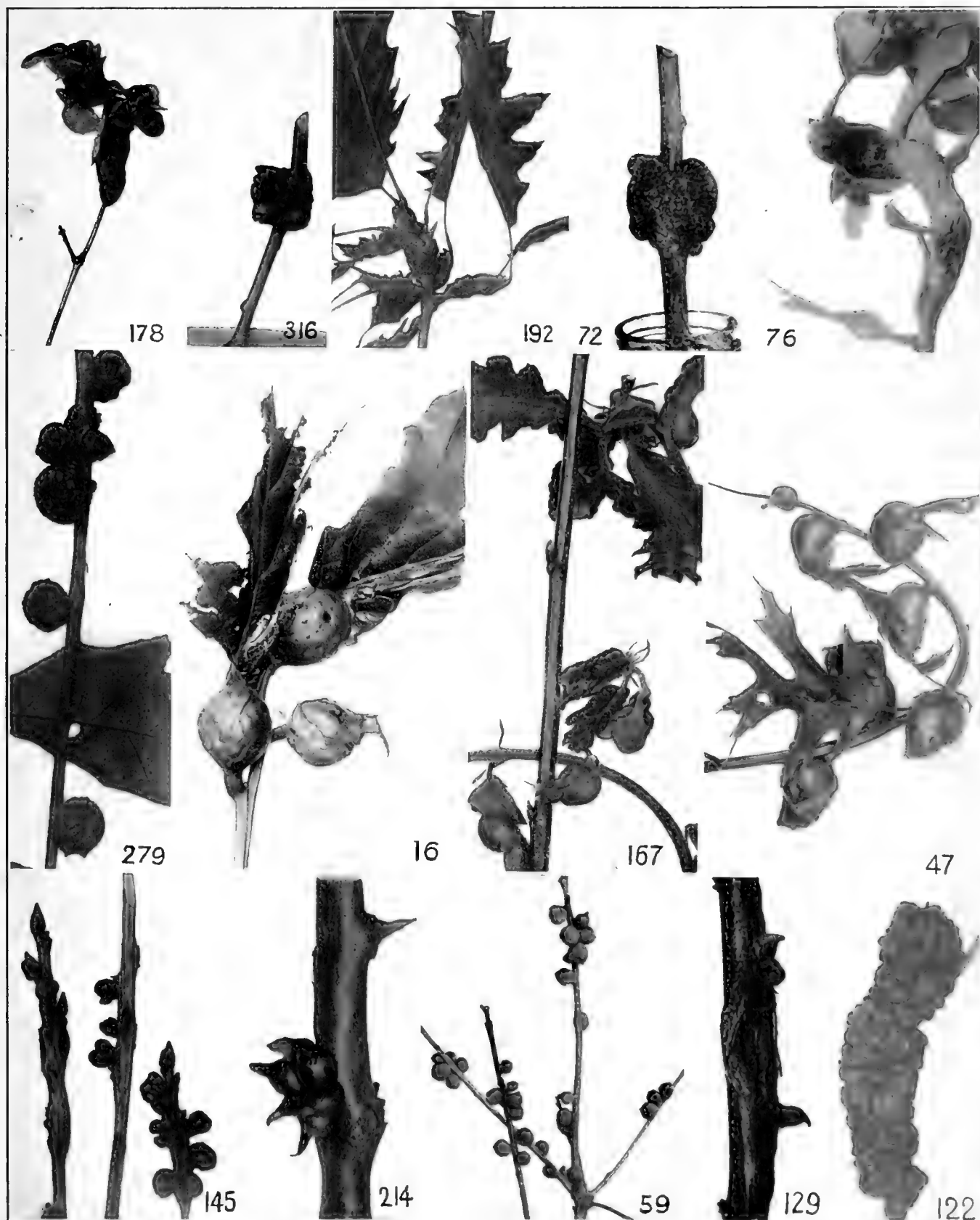
WITCH-HAZEL (*Hamamelis*)

101. *Hormaphis spinosus*. Cook '05, p. 847, fig. 39. *Hamamelistes spinosa*. Witch-hazel. Mass. July. Deformation of bud; spiny, plate 20, 101.
143. *Hormaphis hamamelidis*. Pergande Dept. Agr. 1901, p. 1-24, fig. 1-11. Witch-hazel, Mass. May. Cone on upper side of leaf, on or near lateral veins, plate 20, 143.
201. *Cecidomyia*. Witch-hazel. Mass. June. Short fold downward along vein of leaf, plate 20, 201.  
Unknown.
265. *Cecidomyia*. Witch-hazel. Mass. July. Blister not elevated above surface of leaf. Color on lower side purple brown fading to magenta and pink; above color more intense, center deep magenta with clear pink areola, plate 19, 265.  
Known, not reared, unnamed.

## PLATES

PLATE 1

- 178 *Neuroterus distortus* Bass., oak.
- 316 *Callirhytis cornigerus* O. S., oak.
- 192 *Callirhytis scitula* Bass., oak.
- 72 *Callirhytis punctatus* Bass., oak.
- 76 *Neuroterus batatus* Fitch, oak.
- 279 *Holcaspis globulus* Fitch, oak.
- 16 *Neuroterus noxiosus* Bass., oak.
- 167 *Dryophanta palustris* O. S., oak.
- 47 *Callirhytis tumifica* O. S., oak.
- 145 *Holcaspis fasciata* Bass. (small), oak.
- 214 *Holcaspis bassetti* Gill., oak.
- 59 *Holcaspis mamma* Walsh, oak.
- 129 *Andricus ventricosa* Bass., oak.
- 122 *Biorhiza forticornis* Walsh, oak.

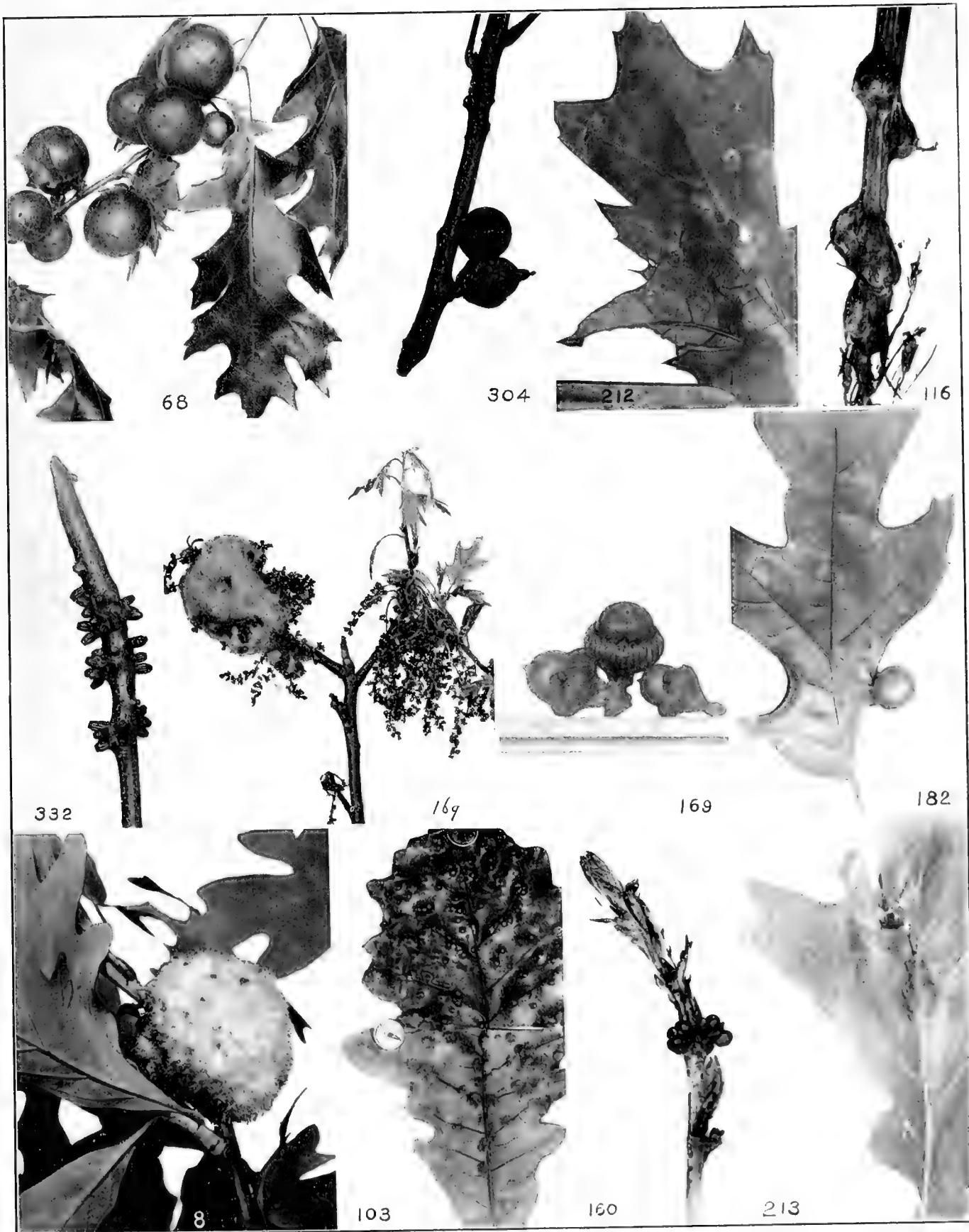


OAK GALLS

PLATE 2

- 68 *Amphibolips confluentus* Harr., oak.  
304 *Amphibolips prunus* Walsh, oak.  
212 *Callirhytis saccularius* Bass., oak.  
116 *Aulacidea podagræ* Bass., oak.  
332 *Andricus formosa* Bass., oak.  
169 *Callirhytis operator* O. S., spring form on catkins, oak.  
169 *Callirhytis operator* O. S., fall form on acorns, oak.  
182 *Andricus osten-sackeni* Bass., oak.  
8 *Callirhytis seminator* Harr., oak.  
103 *Neuroterus floccosus* Bass., oak.  
160 *Neuroterus vesiculus* Bass., oak.  
213 *Andricus piger* Bass., oak.

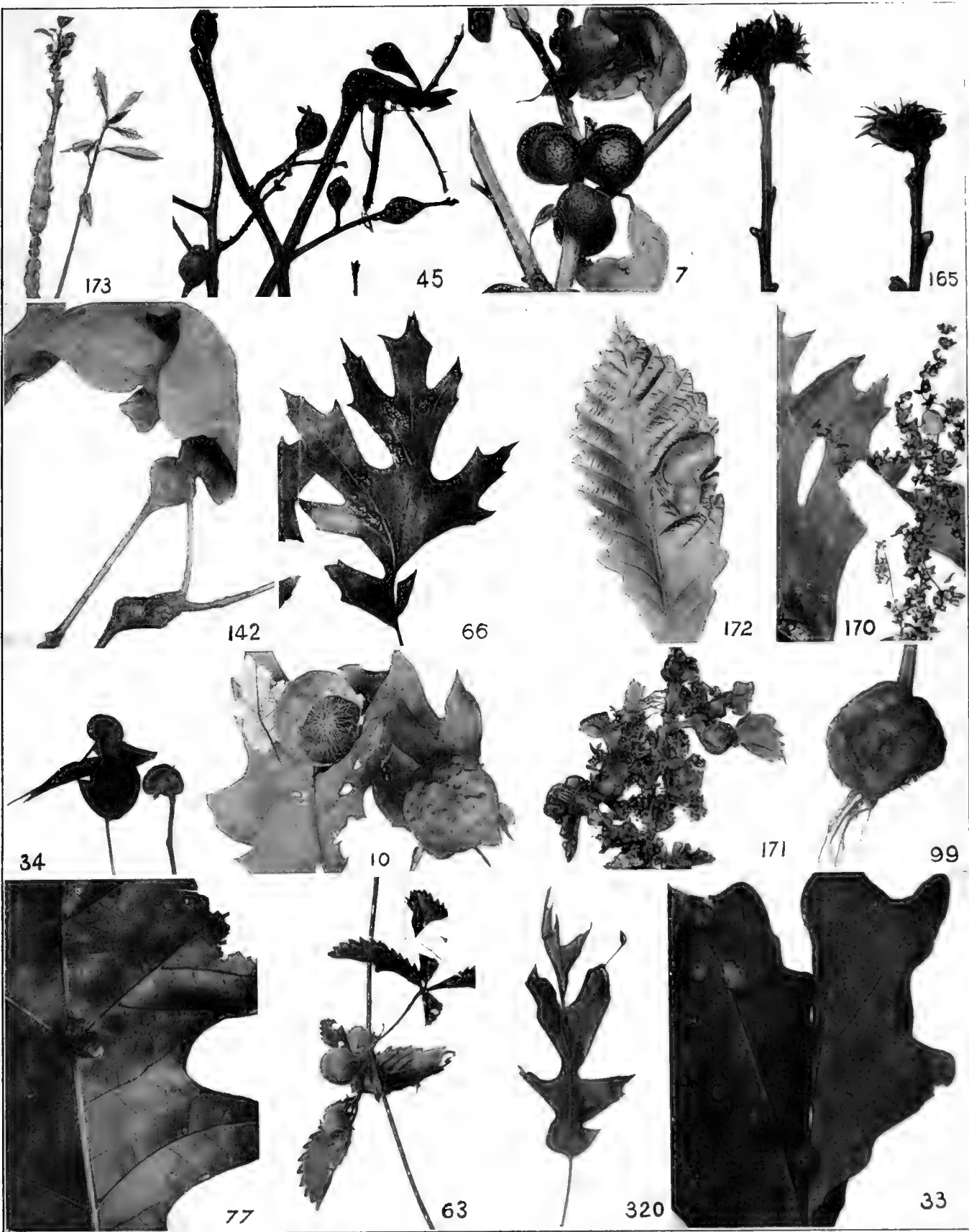




OAK GALLS

PLATE 3

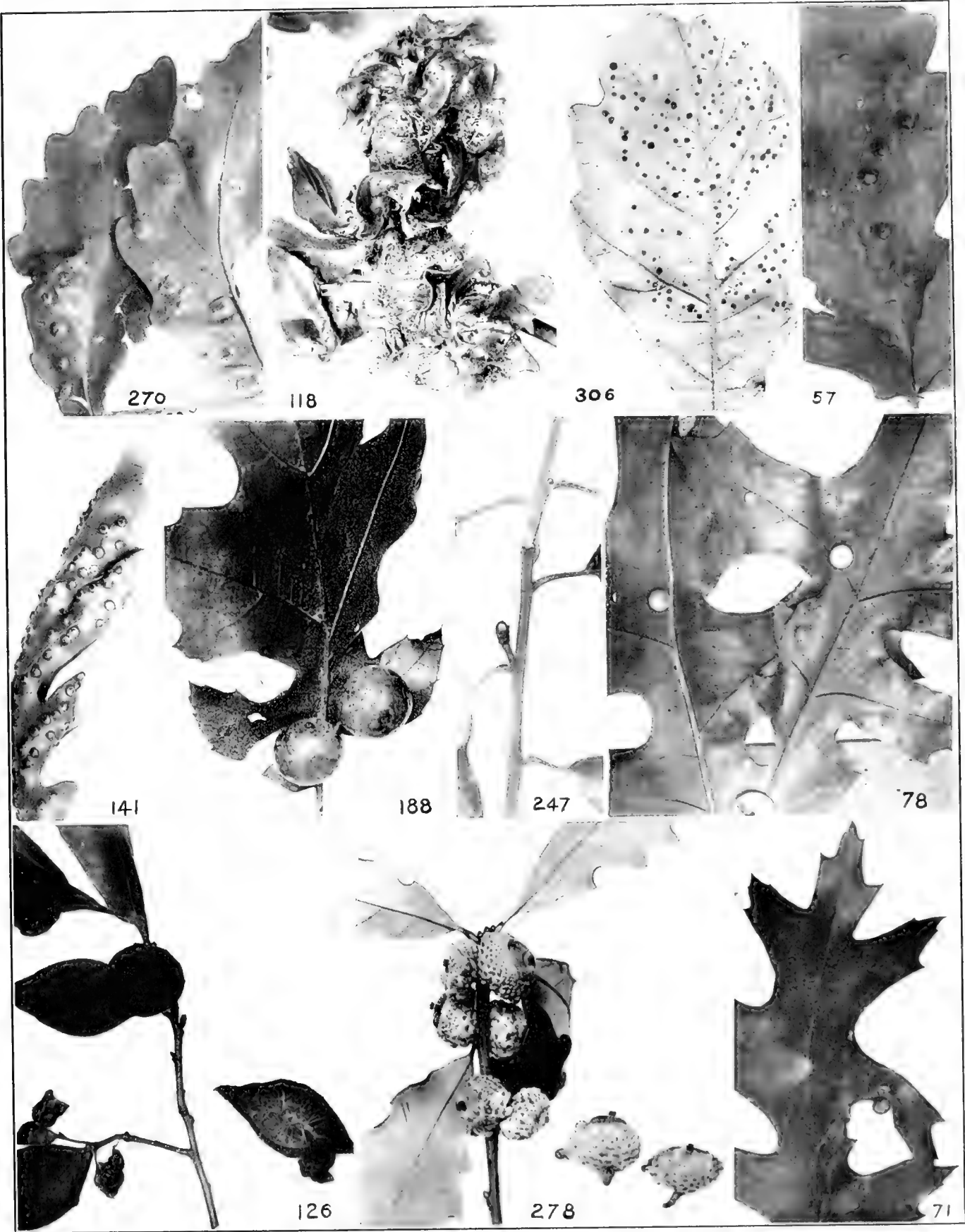
- 173 *Neuroterus rileyi* Bass., oak.
- 45 *Callirhytis similis* Bass., oak.
- 7 *Holcaspis globulus* Fitch, oak.
- 165 *Cynips frondosa* Bass., oak.
- 142 *Callirhytis clavula* O. S., oak.
- 66 *Neuroterus favosus* Bass., oak.
- 172 *Neuroterus irregularis* O. S., oak.
- 170 *Callirhytis pulchra* Bass., oak.
- 34 *Solenozophoria vaccinii* Ashm., oak.
- 10 *Amphibolips inanis* O. S., oak.
- 171 *Andricus cicatriculus* Bass., oak.
- 99 *Diastrophus bassettii* Beutm., oak.
- 77 *Cynips decidua* Bass., oak.
- 63 *Gonaspis potentillæ* Bass., oak.
- 320 *Andricus capsula* Bass., oak.
- 33 *Philonix pezomachoides* O. S., oak.



OAK GALLS

PLATE 4

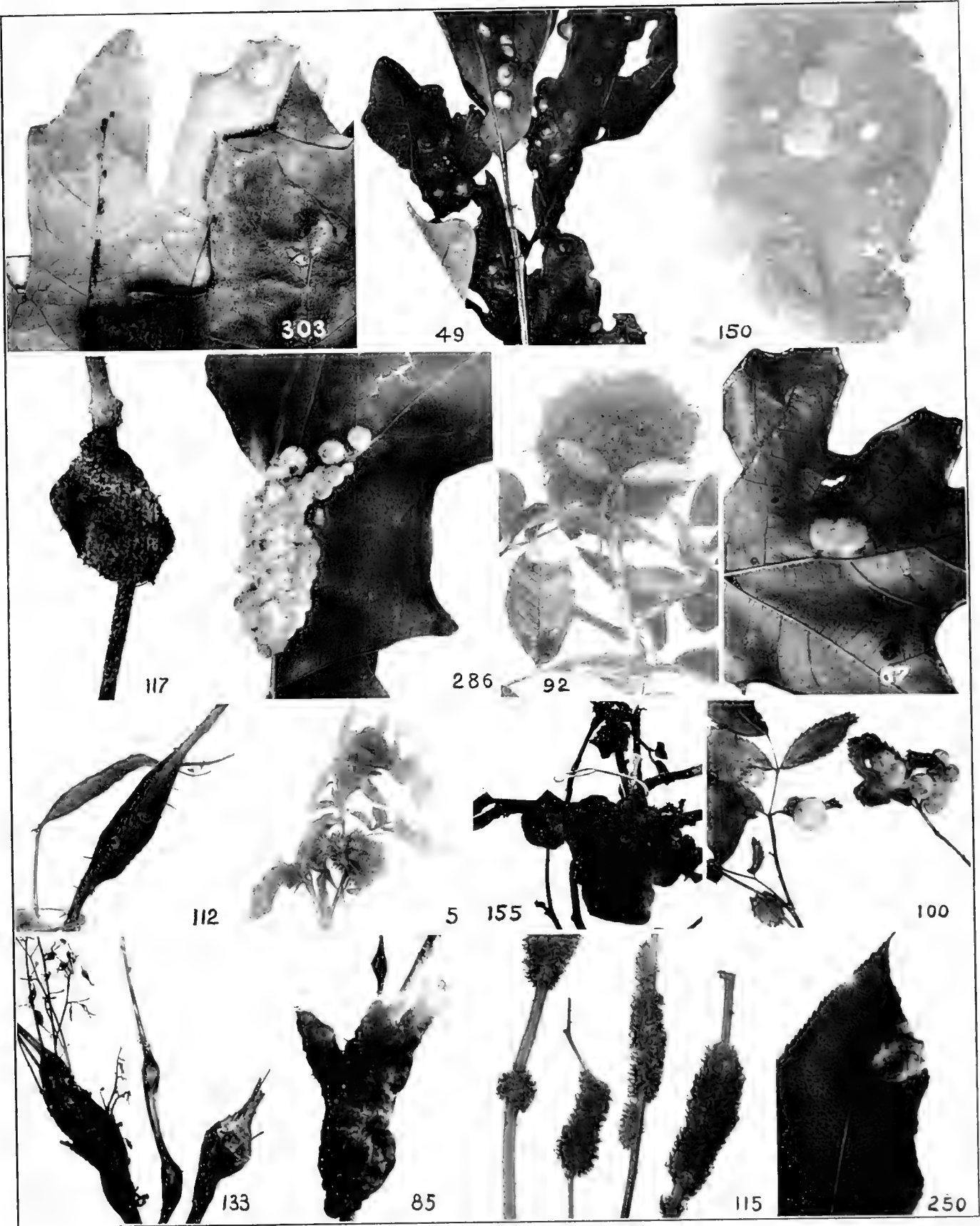
- 270 *Dryophanta papula* Bass., oak.  
118 *Neuroterus noxiosus* Bass., oak.  
306 *Neuroterus umbilicatus* Bass., oak.  
57 *Callirhytis papillata* O. S., oak.  
141 *Neuroterus nigrum* Gill., oak.  
188 *Amphibolips sculpta* Bass. (Beutenmuller considers this identical with *A. nubilipennis* Harr.), oak.  
247 *Andricus perditor* Bass., oak.  
78 *Philonix compressum* Gill., oak.  
126 *Amphibolips ilicifolia* Bass., oak.  
278 *Cynips glandulosus* Riley, oak.  
71 *Andricus singularis* Bass., oak.



OAK GALLS

PLATE 5

- 303 *Neuroterus floccosus* Bass., oak.  
49 *Callirhytis futilis* Bass., oak.  
150 *Andricus flocci* Walsh, oak.  
117 *Diastrophus nebulosus* O. S., oak.  
286 *Andricus piperoides* Bass., oak.  
92 *Rhodites rosæ* Linn., rose.  
67 *Dryophanta lanata* Gill., oak.  
112 *Rhodites dichlocerus* Harr., rose.  
5 *Rhodites bicolor* Harr., rose.  
155 *Diastrophus radicum* Bass., Rubus.  
100 *Rhodites ignota* O. S., rose.  
133 *Aulacidea podagræ* Bass., wild lettuce.  
85 *Diastrophus turgidus* Bass., Rubus.  
115 *Diastrophus cuscuteformis* O. S., Rubus.  
250 *Exoascus* sp. on wild cherry, Prunus.

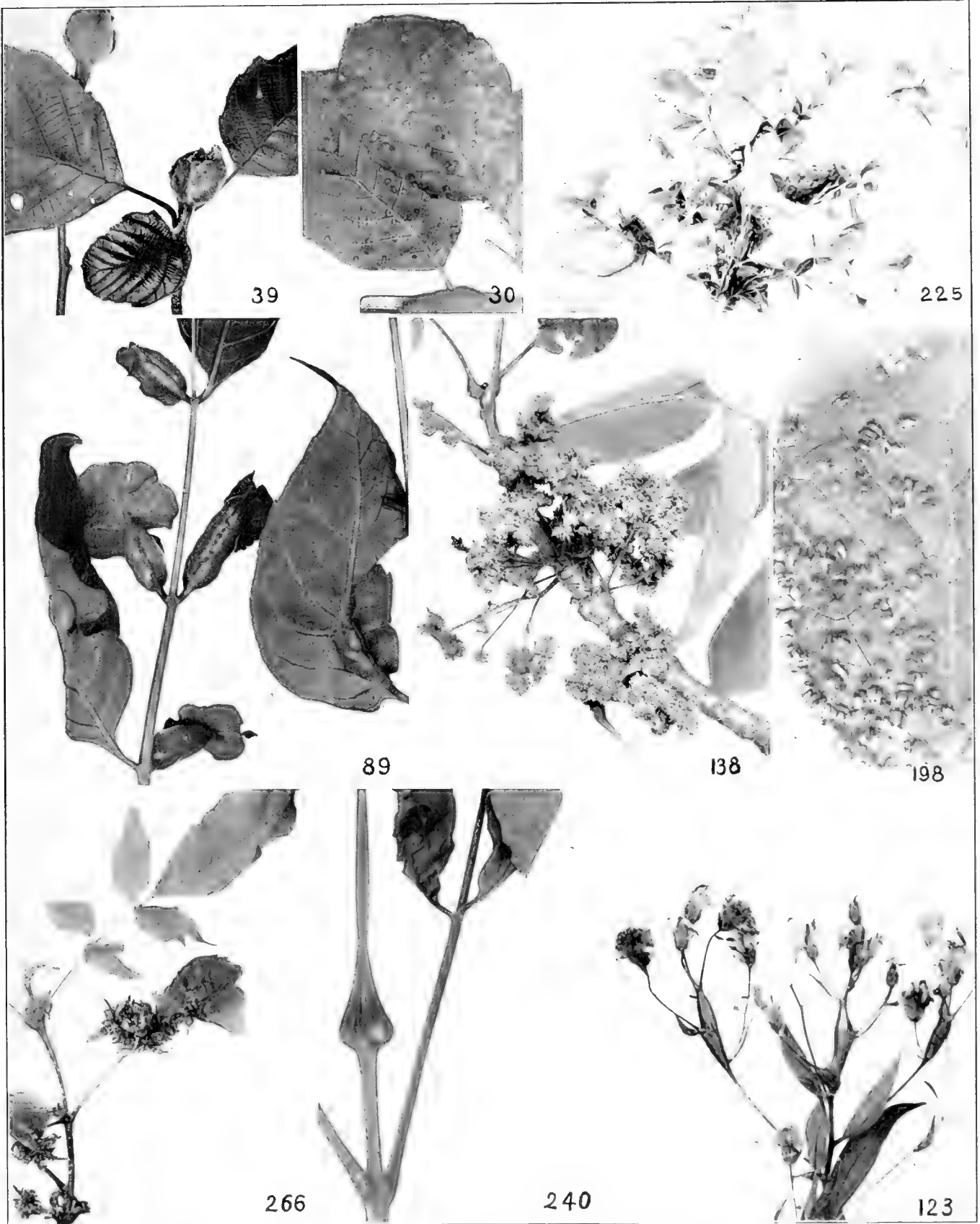


INSECT GALLS

PLATE 6

- 39 *Dasyneura serrulatæ* O. S., alder.
- 30 *Eriophyes* on alder.
- 225 *Exobasidium andromedæ*, Andromeda.
- 89 *Dasyneura tumidosæ* Felt, ash.
- 138 *Eriophyes fraxinifloræ* Felt, ash.
- 198 *Eriophyes fraxini* Garm., ash.
- 266 *Eriophyes* (?) *fraxinifloræ* Felt, ash.
- 240 *Cecidomyia*, undescribed, causing enlargement of the base of the petiole, ash.
- 123 *Neolasioptera ramuscula* Beutm., aster.

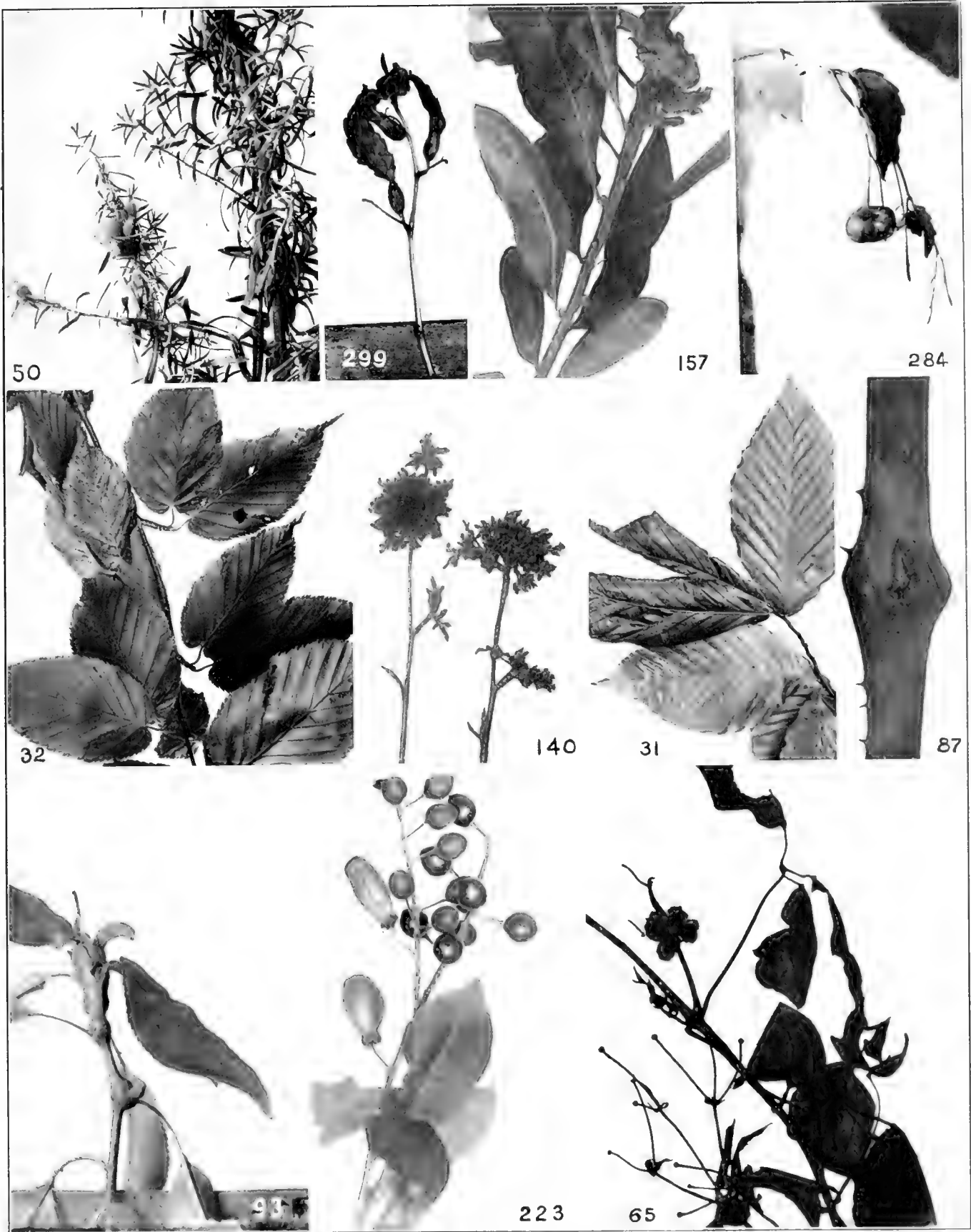




INSECT GALLS

PLATE 7

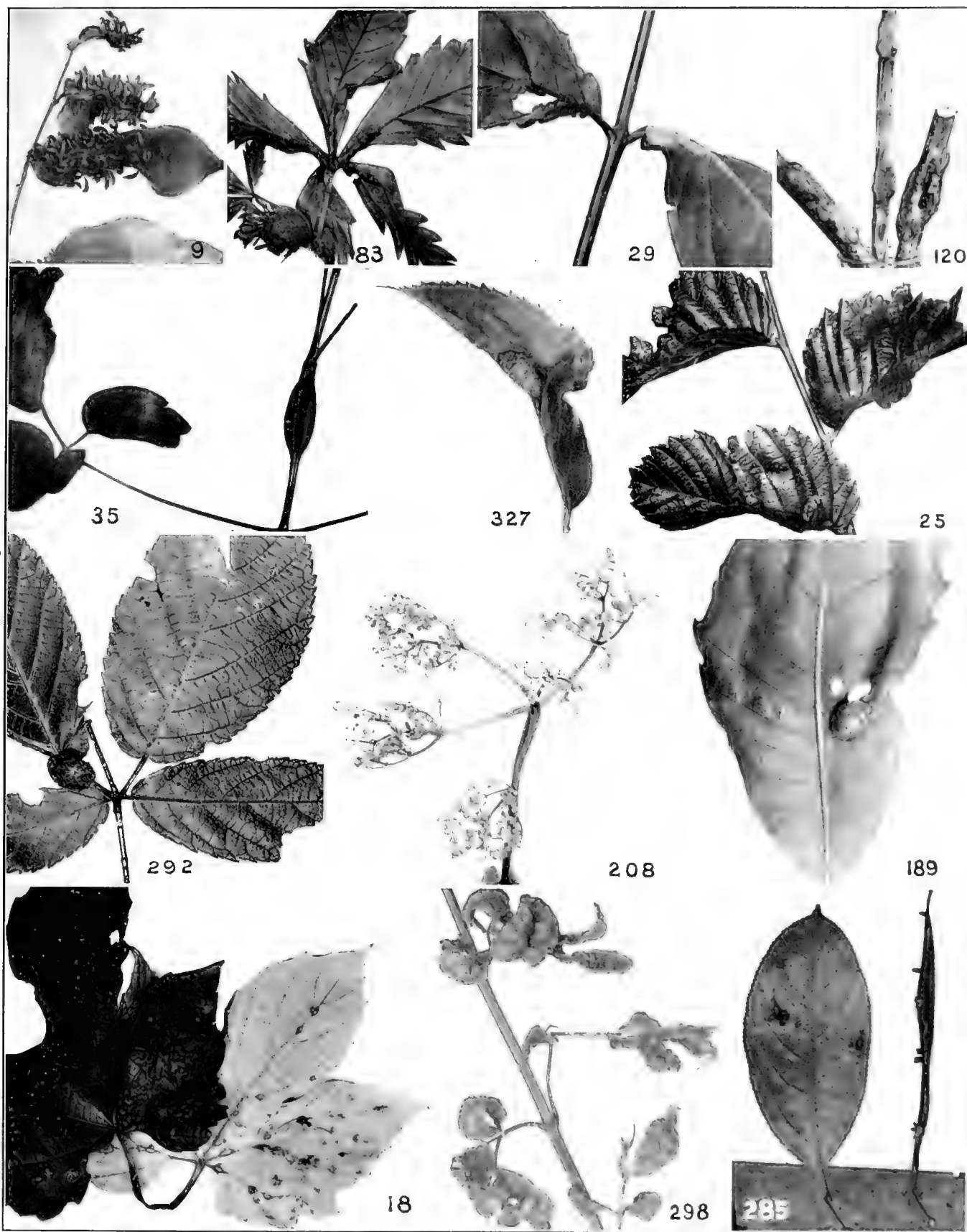
- 50 *Rhopalomyia* (?) *thomi* Felt, Solidago.
- 299 *Lasioptera impatientifolia* Felt, touch-me-not.
- 157 *Eriophyes* on bayberry, *Myrica*.
- 284 *Cecidomyia impatientis* O. S., touch-me-not.
- 32 *Eriophyes* on black birch.
- 140 *Eriophyes* on sweet birch.
- 31 *Eriophyes* on beech.
- 87 *Lasioptera nodulosa* Beutm., blackberry.
- 93 *Cecidomyia serotinæ* O. S., wild cherry.
- 223 *Contarinia virginiensis* Felt, wild cherry.
- 65 *Contarinia clematidis* Felt, clematis.



INSECT GALLS

PLATE 8

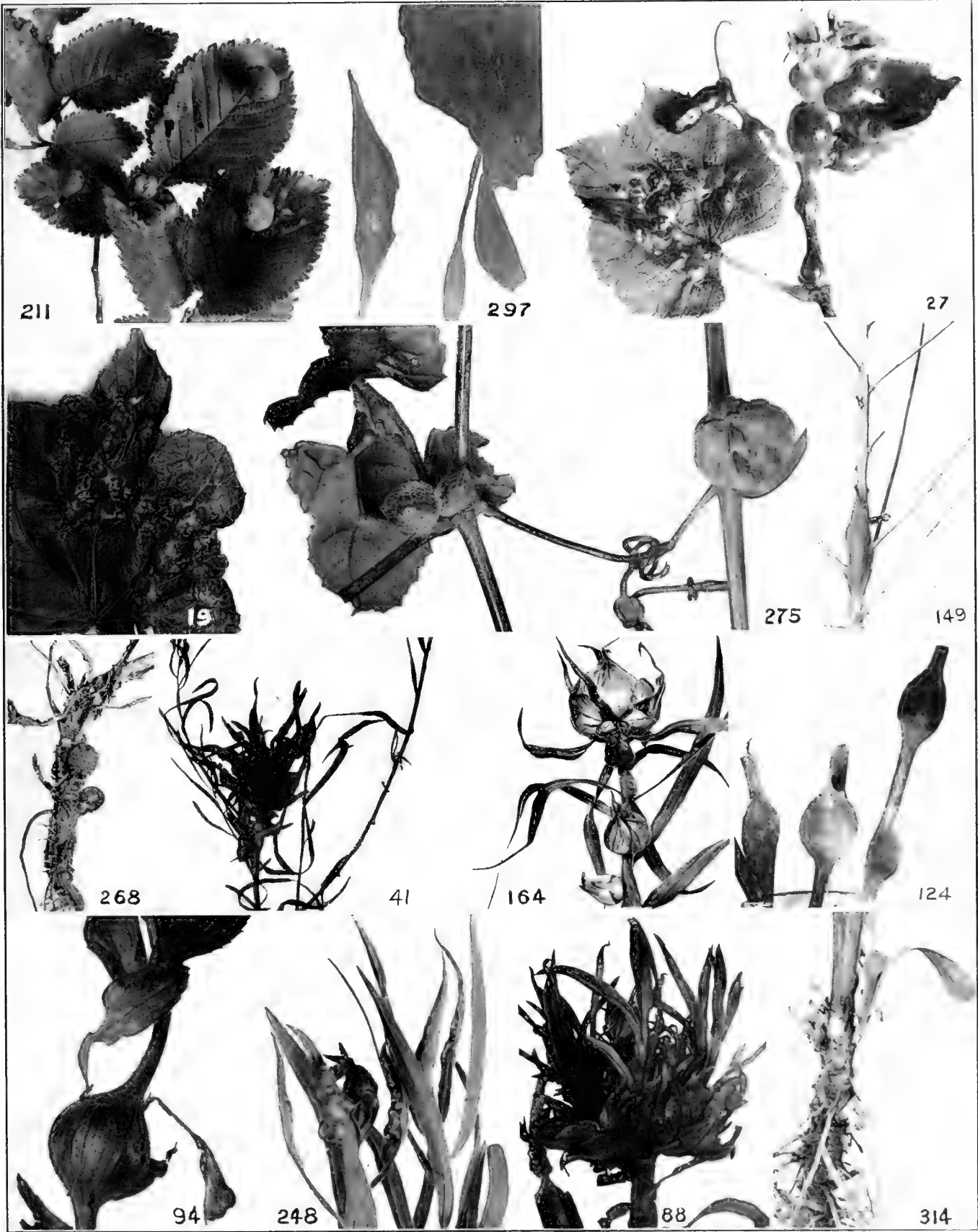
- 9 *Eriophyes* (?) *padi* Nal., plum.
- 83 *Diastrophus niger* Bass., *Potentilla*.
- 29 Unknown, on buttonbush.
- 120 *Neolasioptera sambuci* Felt, *Cornus*.
- 35 (?) *Agromyza*, on clematis.
- 327 *Mycodiplosis cerasifolia* Felt, wild cherry.
- 25 *Colopha ulmicola* Fitch, elm.
- 292 *Lasioptera farinosa* O. S., blackberry.
- 208 *Youngomyia umbellicola* O. S., elder.
- 189 Unknown, probably Cecidomyid, on chestnut.
- 18 Crimson button (*Eriophyes*) on grape.
- 298 *Arthrocnodax sambucifolia* Felt, the larvæ of this midge were probably preying upon mites which caused the deformation.
- 285 (?) *Eriophyes* gall, on *Pyrus arbutifolia*.



INSECT GALLS

PLATE 9

- 211 *Pemphigus ulmi-fusus* Riley, slippery elm.  
297 *Asteromyia petiolicola* Felt, grape.  
27 *Lasioptera vitis* O. S., grape.  
19 Unknown Coleopterous gall on grape.  
275 *Schizomyia pomum* Walsh, grape.  
149 *Eucosma scudderiana* Clem., Solidago.  
268 *Rhopalomyia hirtipes* O. S., young galls, subterranean form, Solidago.  
41 *Asphondylia monacha* O. S., Solidago.  
164 *Rhopalomyia hirtipes* O. S., mature, aerial form, Solidago.  
124 *Lasioptera solidaginis* O. S. (*tumifica* Beutm.), Solidago.  
94 *Eurosta solidaginis* Fitch, Solidago.  
248 *Puccinia solidaginis* Peck, rust on Solidago.  
88 *Rhopalomyia solidaginis* O. S., Solidago.  
314 *Rhopalomyia bulbula* Felt, Solidago.

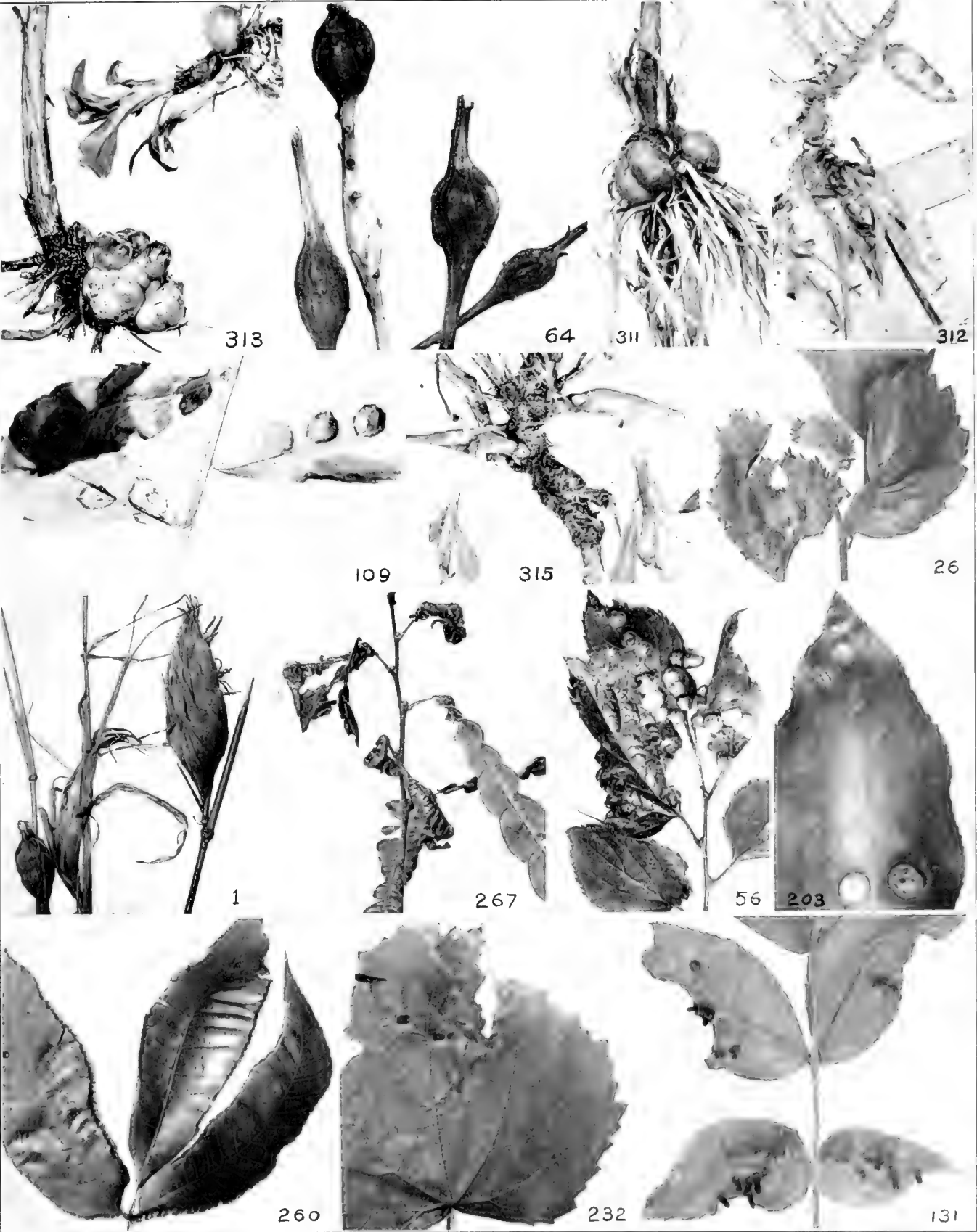


INSECT GALLS

PLATE 10

- 313 *Rhopalomyia* (?) *thompsoni* Felt, Solidago.
- 64 *Gnorimoschema* *gallasolidaginis* Riley, Solidago.
- 311 *Rhopalomyia* *hirtipes* O. S., Solidago.
- 312 *Eurosta* *reticulata* Snow, Solidago.
- 109 *Asteromyia* *rubra* Felt, Solidago.
- 315 *Eutreta* *sparsa* Wied., Solidago.
- 26 *Phytophaga* *ulmi* Beutm., elm.
- 1 *Asteromyia* *agrostis* O. S., Muhlenbergia.
- 267 *Janetiella* *asplenifolia* Felt., sweet fern.
- 56 *Pachypsylla* *celtidis-mamma* Pack., hackberry.
- 203 *Phylloxera* *rimosalis* Perg., hickory.
- 260 *Eriophyes* on hickory.
- 232 *Cecidomyia* *viticola* O. S., grape.
- 131 *Caryomyia* *tubicola* O. S., hickory.

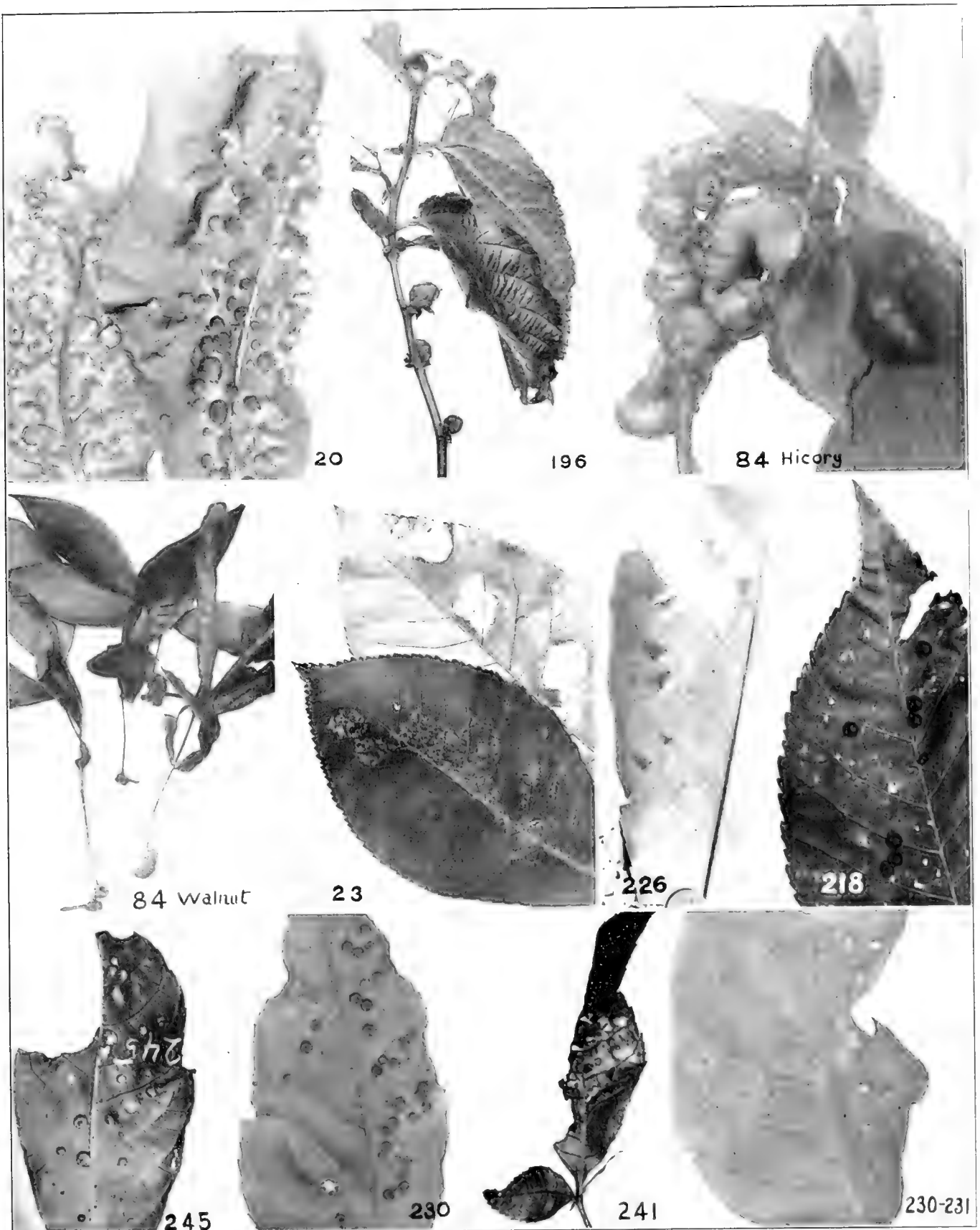




INSECT GALLS

PLATE 11

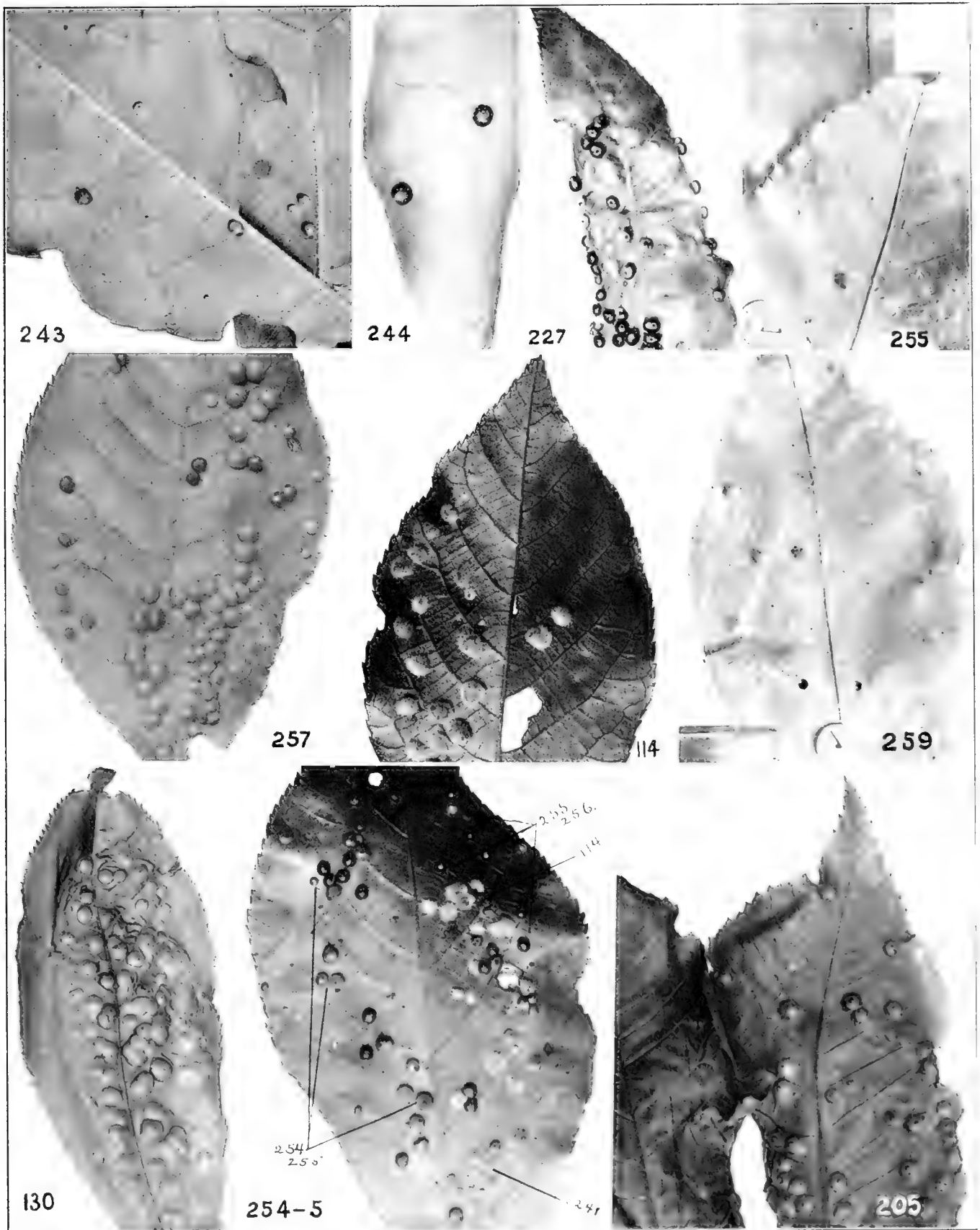
- 20 *Phylloxera carya-fallax* Riley.
- 196 *Eriophyes* on hazel.
- 84 *Phylloxera caryacaulis* Fitch, hickory.
- 84 *Phylloxera* galls on walnut.
- 23 Fungus on hickory.
- 226 *Caryomyia caryacola* O. S., hickory.
- 218 *Caryomyia caryæ* O. S., hickory.
- 245 *Caryomyia caryæ* O. S., hickory.
- 230 *Caryomyia* species, hickory.
- 241 *Caryomyia sanguinolenta* O. S., hickory.
- 230-231 *Caryomyia tubicola* O. S. and *Caryomyia* sp., hickory.



HICKORY GALLS

PLATE 12

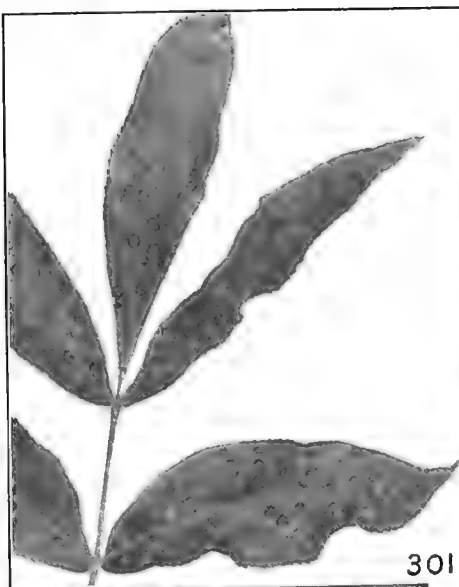
- 243 *Caryomyia sanguinolenta* O. S., hickory.
- 244 *Caryomyia caryæ* O. S., hickory.
- 227 *Caryomyia thompsoni* Felt, hickory.
- 255 *Caryomyia caryæ* O. S., hickory.
- 255 *Caryomyia caryæ* O. S., hickory.
- 114 *Caryomyia holotricha* O. S., hickory.
- 259 *Mycodiplosis holotricha* Felt, hickory.
- 130 *Phylloxera caryæ-globuli* Pack., hickory.
- 254-5 *Caryomyia caryæ* O. S., hickory.
- 205 *Phylloxera avellana* Perg., hickory.



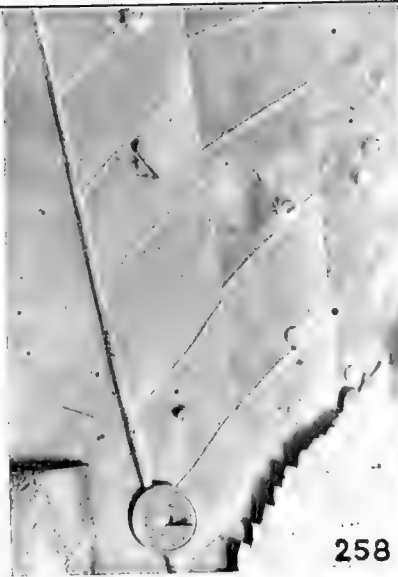
HICKORY GALLS

PLATE 13

- 301 *Phylloxera caryæ-semen* Pack., hickory.  
258 *Caryomyia inanis* Felt probably true producer; *Clinodiplosis caryæ* Felt, presumably an inquiline, hickory.  
242 *Caryomyia holotricha* O. S., hickory.  
228 *Caryomyia* species, hickory.  
95 Aphid on sugar maple.  
22 *Eriophyes acericola* Garm., maple.  
179 *Cecidomyia pudibunda* O. S., ironwood, *Carpinus*.  
317 *Agromyza magnicornis* Lw., iris.  
82 *Lasioptera lycopi* Felt, bugle weed, *Lycopus*.



301



258



242



228



95



22



179



317

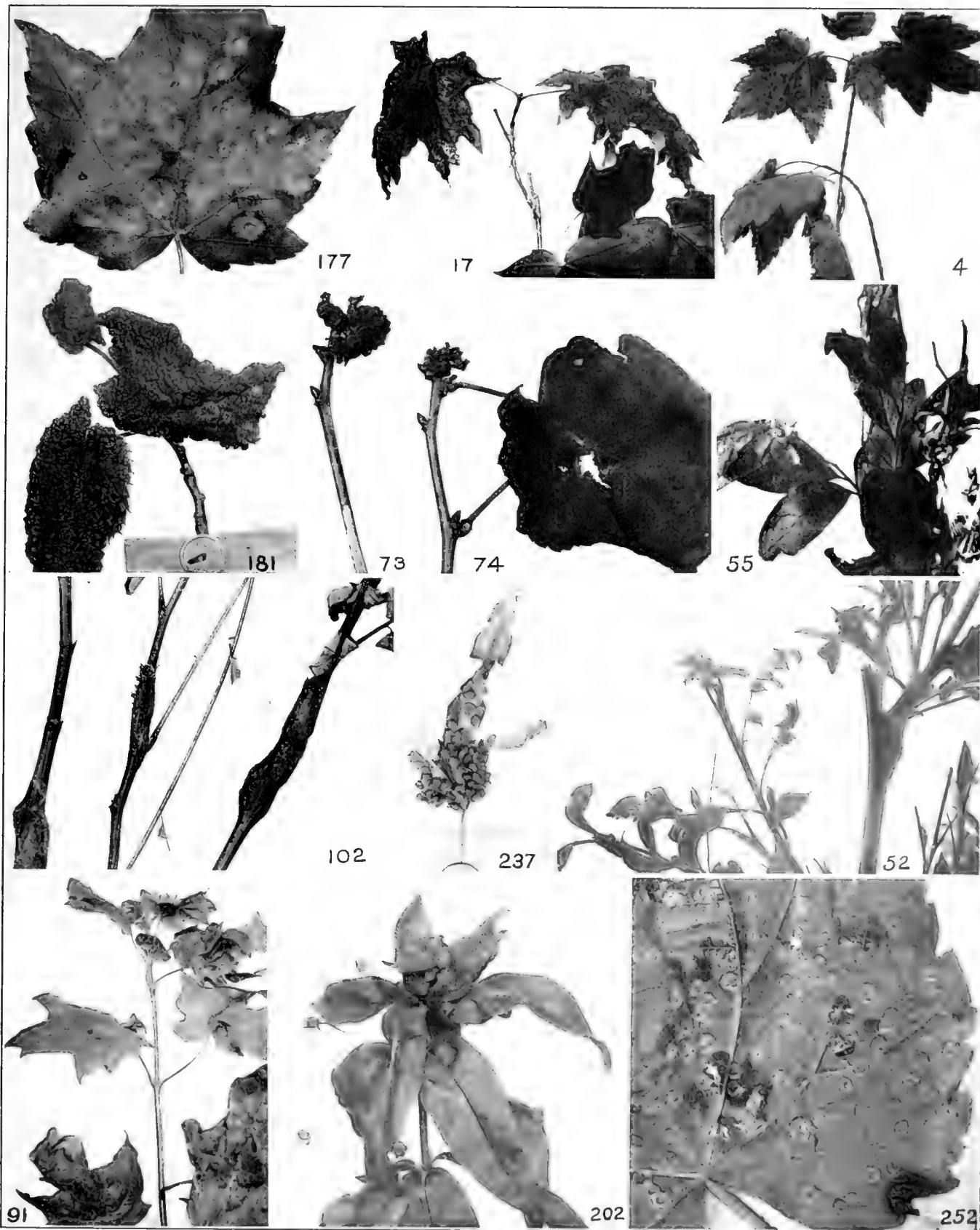


82

PLATE 14

- 177 *Cecidomyia ocellaris* O. S., soft maple.
- 17 *Eriophyes quadripes* Shim., soft maple.
- 4 *Eriophyes* on *Acer rubrum*, red maple.
- 181 *Eriophyes* (?) *abnormis* Garm., soft maple.
- 73 *Cecidomyia citricola* O. S., basswood.
- 74 *Cecidomyia citricola* O. S., basswood.
- 55 *Exobasidium vaccinii* Wor., huckleberry flowers.
- 102 *Ecdytolopha insiticiaria* Zell., locust.
- 237 *Eriophyes quadripes* Shim., soft maple.
- 52 *Dasyneura gleditschiae* O. S., honey locust.
- 91 *Dasyneura communis* Felt, red maple.
- 202 *Dasyneura lysimachiae* Beutm., loosestrife.
- 252 *Cecidomyia verrucicola* O. S., probably young stage, basswood.

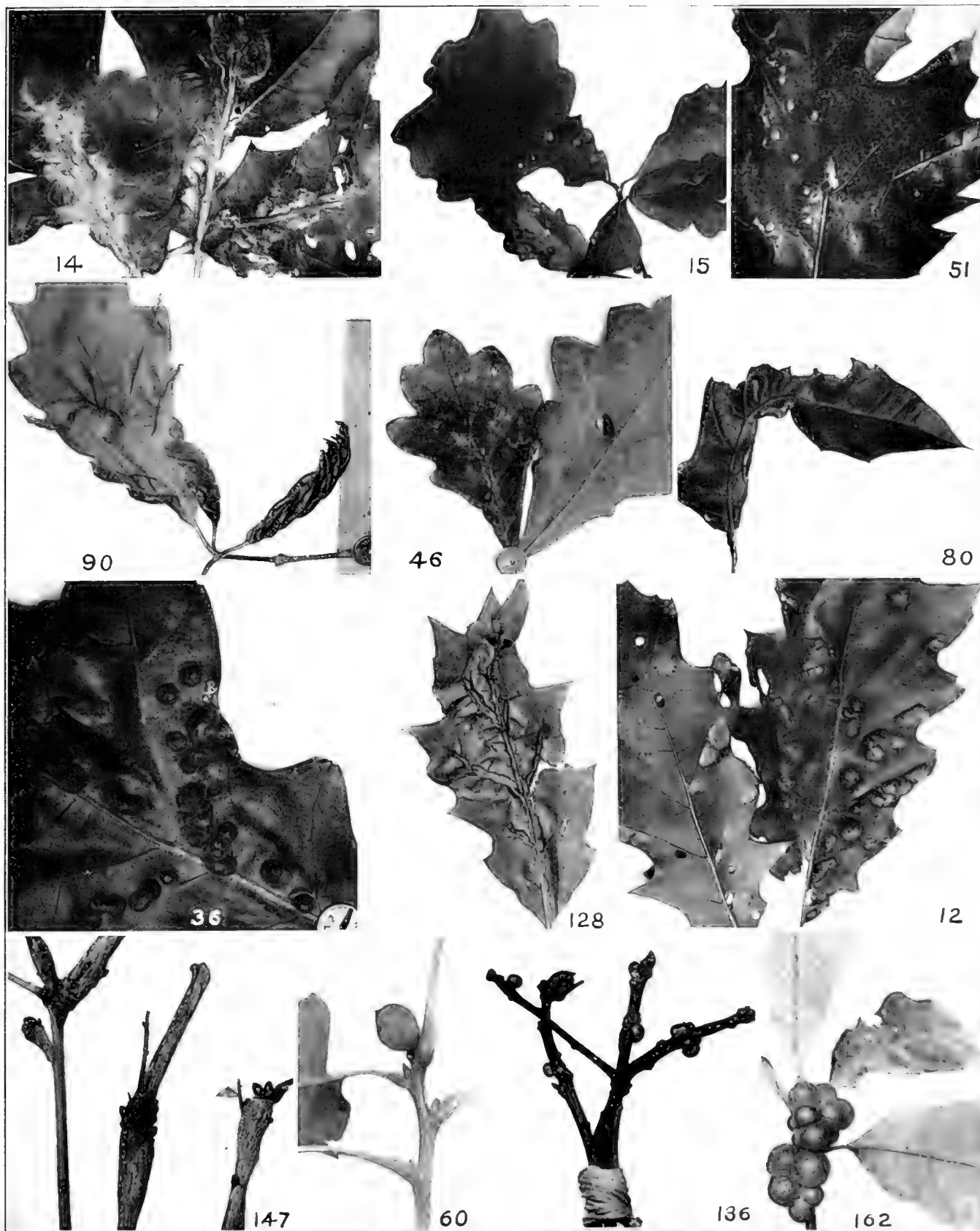




INSECT GALLS

PLATE 15

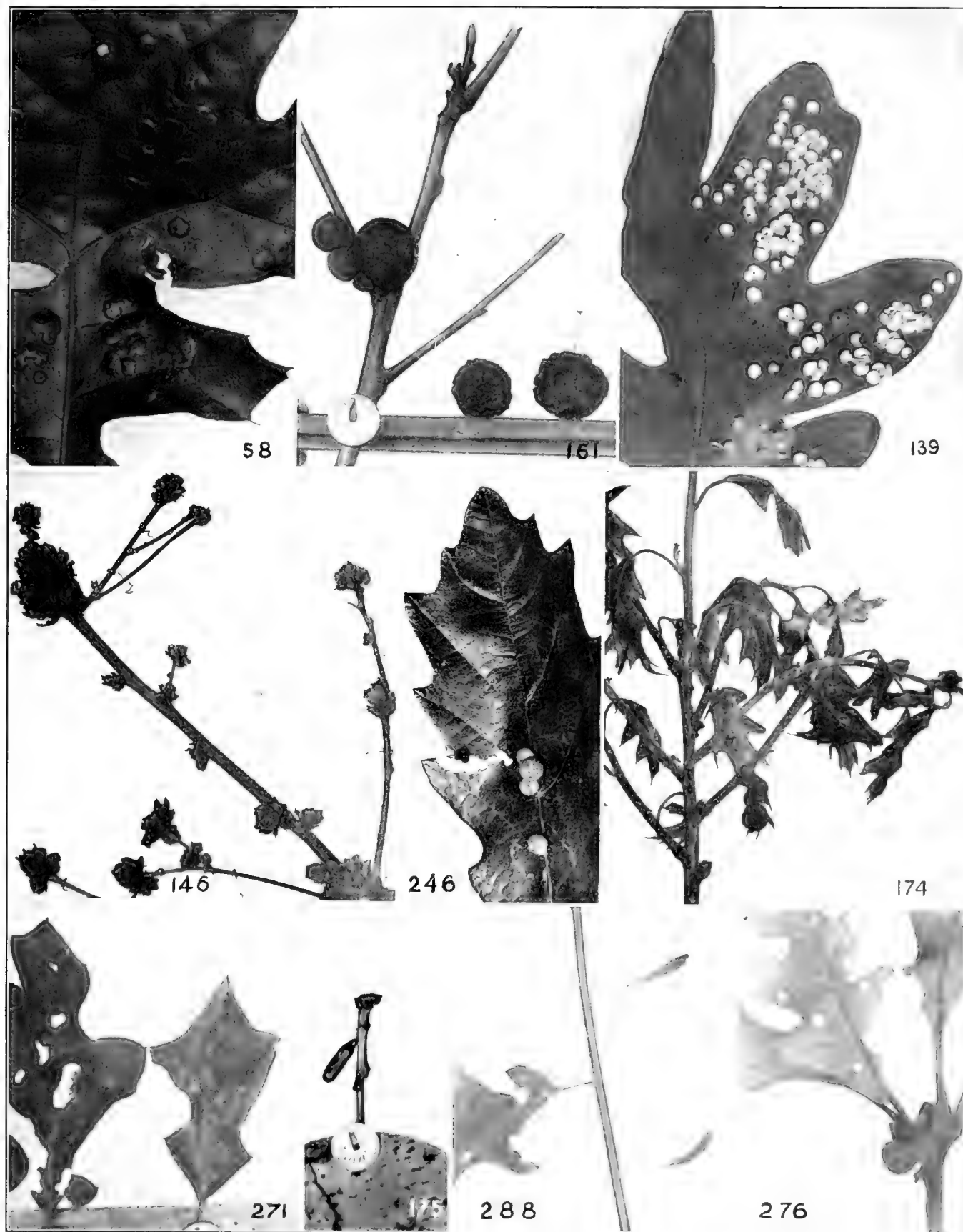
- 14 *Cecidomyia niveipila* O. S., oak.
- 15 (?) *Neuroterus* sp., oak.
- 51 *Cincticornia* species, oak.
- 90 *Cecidomyia majalis* O. S., oak.
- 46 *Cincticornia* species, oak.
- 80 *Cecidomyia* species, oak.
- 36 *Cincticornia pilula* Walsh, oak.
- 128 *Cecidomyia* species, oak.
- 12 Fungus on red and chestnut oak leaves.
- 147 (?) *Lasioptera querciperda* Felt, oak.
- 60 *Amphibolips* (?) *globulus* Beutm., oak.
- 136 *Biorhiza forticornis* Fitch, oak.
- 162 (?) *Holcaspis globulus* Fitch, oak.



OAK GALLS

PLATE 16

- 58 *Cincticornia pustuloides* Beutm., oak.
- 161 Cynipid or fungus, oak.
- 139 *Cecidomyia poculum* O. S., oak.
- 146 *Eriophyes* on oak.
- 246 Unknown, on oak.
- 174 *Andricus petiolicola* Bass., oak.
- 271 *Neuroterus* (?) *verrucarum* O. S., oak.
- 175 (?) *Neuroterus* sp., oak.
- 288 Possibly *Dryophanta pedunculata* Bass., developing on tender oak twig.
- 276 *Cynips strobilana* O. S., oak.



OAK GALLS

PLATE 17

- 277 *Andricus rileyi* Ashm., oak.  
209 *Cecidomyia* species, Cornus.  
236 Unknown, on oak.  
273 *Callirhytis papillatus* O. S., chestnut oak.  
53 *Eriophyes* on plum.  
305 *Andricus lana*, oak.  
283 *Cecidomyia balsamicola* Lintn., balsam fir.  
21 (?) *Mycodiplosis populifolia* Felt, poplar.  
318 *Chermes abietis* Linn., spruce.

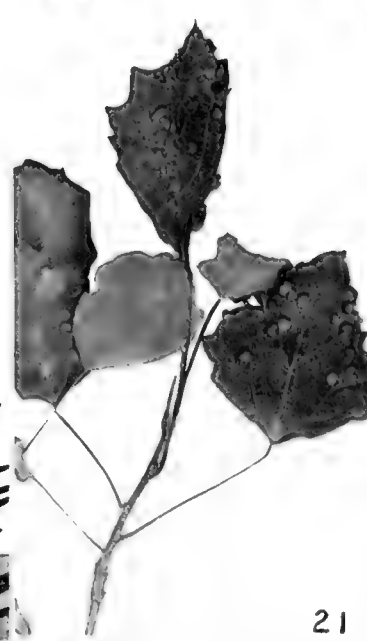
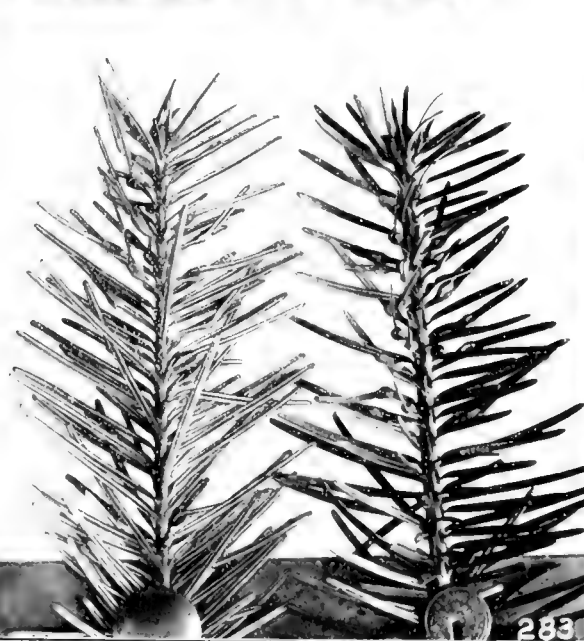
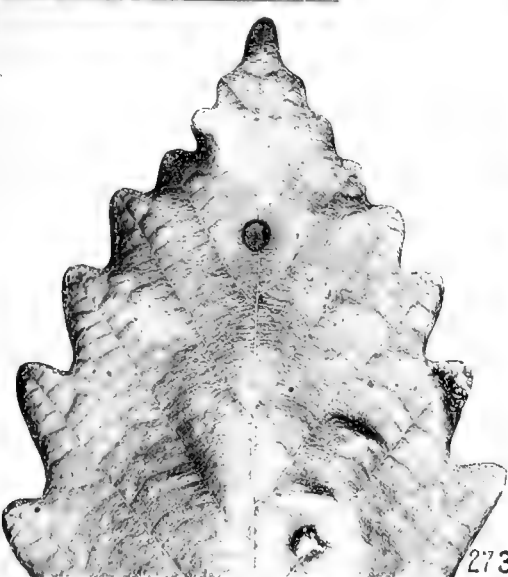


PLATE 18

- 302 *Andricus lana* Fitch, oak.  
13 *Eriophyes* on poison ivy.  
295 *Andricus lana*, oak.  
54 *Chermes abietis* Linn., spruce.  
287 (?) *Dryophanta ignota* Bass., oak.  
290 (?) *Dryophanta ignota* Bass., early stage, oak.  
3 *Cecidomyia pini-rigidæ* Pack., pine.  
180 *Hormomyia cratægifolia* Felt, Cratægus.  
86 (?) *Hormomyia clarkei* Felt, Cratægus.  
75 *Euura ovum* Walsh, willow.  
96 *Pemphigus rhois* Walsh, sumac.  
289 *Ectademia poputella* Busek, poplar.  
210 *Pemphigus populicaulis* Pack., poplar.  
281 *Mycodiplosis populifolia* Felt, poplar.

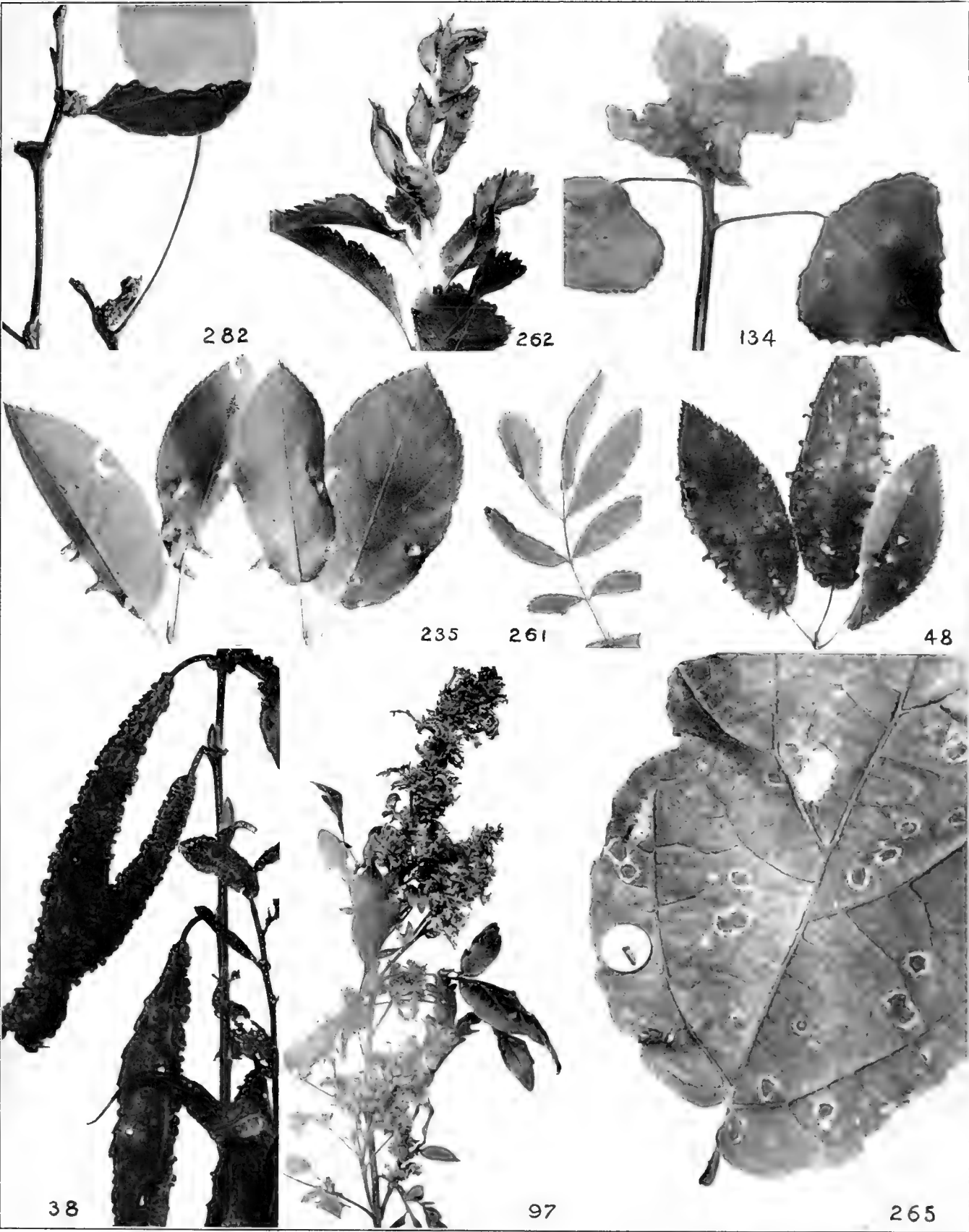




INSECT GALLS

PLATE 19

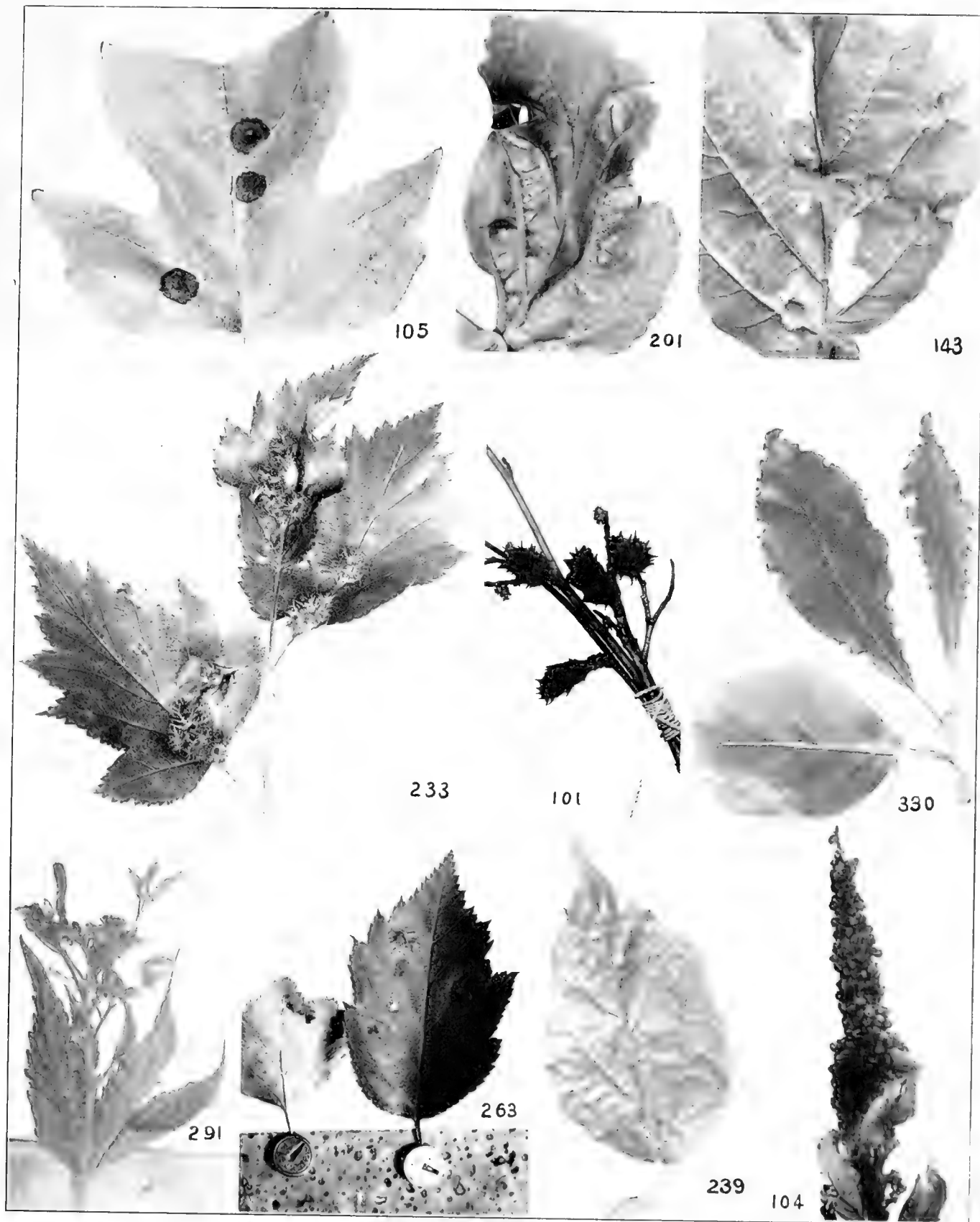
- 282 *Eriophyes* species on poplar.
- 262 *Rhabdophaga salicifolia* Felt, spiræa.
- 134 *Pemphigus vagabundus* Walsh, poplar.
- 235 *Hormomyia canadensis* Felt, shad-bush.
- 261 *Dasyneura rosarum* Hardy, rose.
- 48 *Hormomyia canadensis* Felt, shad-bush.
- 38 *Eriophyes* on willow.
- 97 *Eriophyes* or fungus on *Rhus copallina*.
- 265 *Cecidomyia*, not reared, on witch-hazel.



INSECT GALLS

PLATE 20

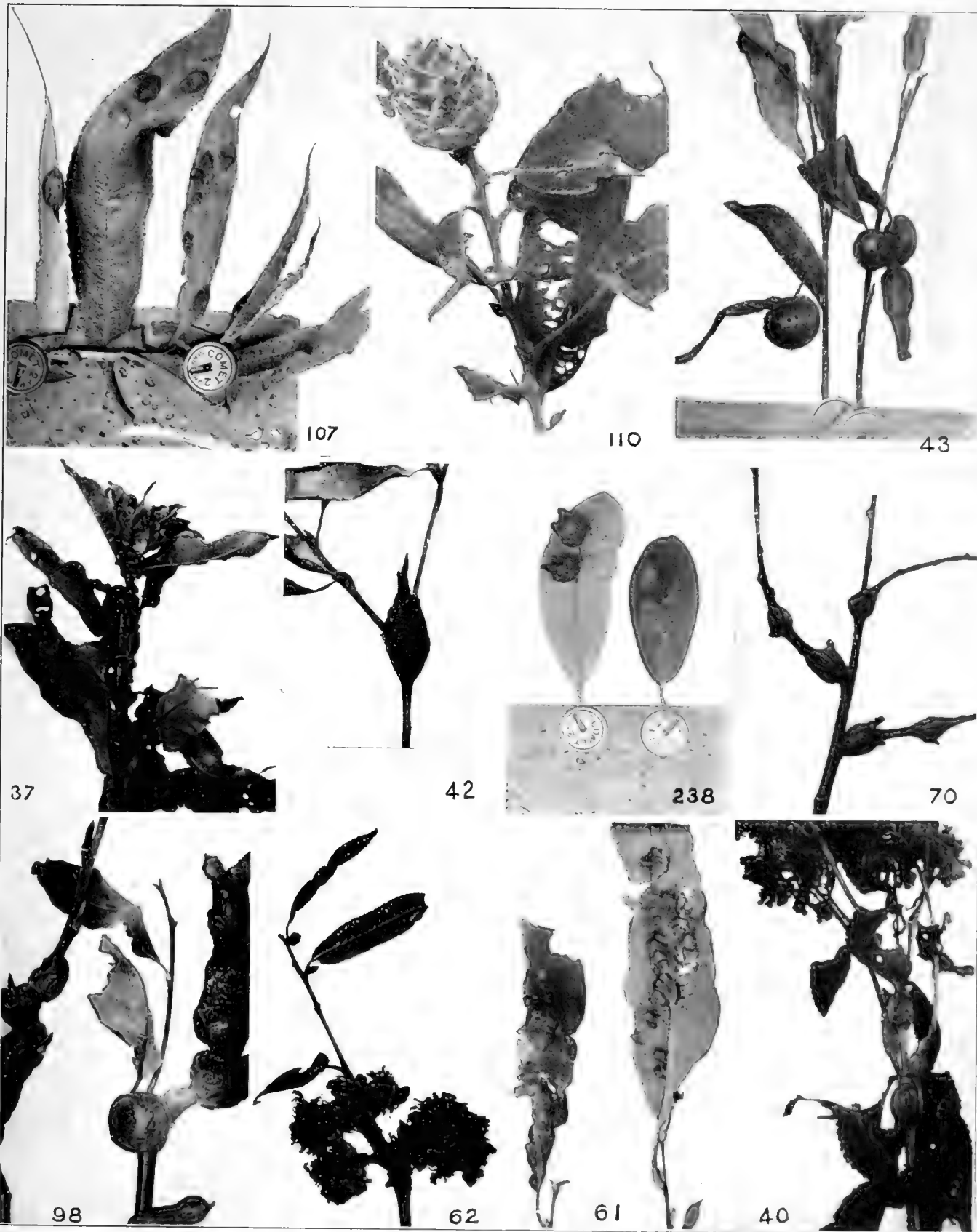
- 105 *Contarinia liriodendri* O. S., tulip tree.
- 201 *Cecidomyia* on witch-hazel.
- 143 *Hormaphis hamamelidis* Perg., witch-hazel.
- 233 *Lestodiplosis crataegifolia* Felt. (This is a predaceous form, the true producer is unknown),  
Cratægus.
- 101 *Hormaphis spinosus* Shim., witch-hazel.
- 330 *Eriophyes* on *Nyssa*.
- 291 *Dasyneura purpurea* Felt, Joe-pye-weed.
- 263 *Lasioptera excavata* Felt, Cratægus.
- 239 *Sackenomyia* (?) *viburnifolia* Felt, Viburnum.
- 104 *Rhabdophaga salicifolia* Felt, spiræa.



INSECT GALLS

PLATE 21

- 107 *Nematus desmodioides* Walsh, willow.
- 110 *Rhabdophaga strobiloides* Walsh, willow.
- 43 *Nematus pomum* Walsh, willow.
- 37 *Rhabdophaga triticoides* Walsh, willow.
- 42 *Phytophaga rigidæ* Walsh, willow.
- 238 (?) *Cecidomyia* on willow.
- 70 *Rhabdophaga nodula* Walsh, willow.
- 98 *Rhabdophaga batatas* Walsh, willow.
- 62 *Eriophyes* on willow.
- 61 *Hormomyia verruca* Walsh, willow.
- 40 *Neolasioptera perfoliata* Felt, thoroughwort.



INSECT GALLS





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